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317A (Restricted)



AMENDMENTS

TO

I.S.T.D./C/317

INTELLIGENCE DIV. CSUSA
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RAILWAYS
OF

SOUTH-WEST GERMANY

Dated January 1944

WITH

Additional Lines in the Area and
Connecting Lines

FROM

WESTERN AUSTRIA AND ITALY

RECORDED

380

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

- Page IV. Amend "Mühlhausen" to read "Mühlhouse".
- Page 1. Generaldirektion der Werkstätten.
After Kassel add Vienna (Wien).
- Page 2. State Railway Construction Divisions.
Delete whole paragraph.
- Page 3. Traffic.
Amend paragraph to read:
"The following statistics, computed from percentage traffic increase figures given by Dr. Ganzerrmüller"
- Page 4. 14. Itineraries.
add
Detailed information on major bridges and tunnels is given in reports I.S.T.D./Q/317B and 317C respectively.
- Page 135. Route 112. Offenburg - Konstanz.
General Details.
3. Track: Amend to read "Double throughout".
13. Capacity: Amend to read "48 trains per day each way with a net train load of 200 tons military stores, throughout from Offenburg to Konstanz.
- Page 137. Route 121. Lindau - Innsbruck.
Note. Details of bridges and tunnels have been taken from the original profiles of line, reproduced as Plans 58a and 58b, and do not include the tunnels at 88.3 and 90.0 Km of c.1100m and 300m respectively, necessitated by the great landslip of 1892.
- Page 191. 88.0 Km. Wald (Arlberg) to read
* 88.0 Km. Wald (Arlberg) FL. (440m) W.
or Dannofer. Electric sub-station.
Delete
88.2 Km Dannofer.
Insert
88.3 Tunnel c.1100m.
90.0 Tunnel c. 300m.

NOTE. The following should be endorsed on the Cover
of Report L.S.T.D./C/317:

**"This Fascicle should be read only in conjunction
with the Amendments."**

For details of contiguous Lines refer to:—

I.S.T.D./C/240	NORTH ITALY	Sept. 1943
I.S.T.D./D 324	MIDDLE DANUBE	May 1944
I.S.T.D. C/320	EASTERN FRANCE	Apr. 1943
I.S.T.D./C 320 Amdt. I	" "	About to issue
I.S.T.D./C 316	NORTH-WEST GERMANY	Jan. 1944

INTRODUCTORY NOTE

In addition to correcting omissions and errors in the existing report I.S.T.D./C/317, the object of I.S.T.D./C/317A is to amplify the information already given in the existing report, particularly so far as the principal railway junctions and centres are concerned, and to provide a link with the Northern Italy and Middle Danube reports, by the inclusion of itineraries of the principal connecting lines from Italy and Western Austria.

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AMENDMENTS TO I.S.T.D./C/317

Page 1. Introduction

(1) For "Maps and Plans" read "Map of System."

Itineraries

Route 64. Amend "LAUTERBECKEN-GROMBACH" to "LAUTERBECKEN-GRUMBACH."

Route 65. For "NEUSTADT" read "NEUSTADT (WEIMAR)."

Route 67. Amend to read "KARLSRUHE-GRABEN-NEUDORF-MANNHEIM-DARMSTADT-FRANKFURT."

Route 70. "GRABEN-NEUDORF" should read "GRABEN-NEUDORF."

Route 71. "NEUSTADT" should read "NEUSTADT (WEIMAR)."

Route 78. Amend title to read "BIELEFELD-BACKNANG-SCHWAB HALL-HEIMTAL."

Page 2

Route 84. Amend to read "INGOLSTADT-DONAUWORTH-GÜTERSLOH."

Route 90. For "NEUSTADT" read "NEUSTADT (ALICE)."

After Route 91 insert "For revised list of itineraries including supplementary routes see C/317A."

Page 3. Introduction

Insert "C/317A has been prepared to cover additional selected lines in the quadrilateral area FRANKFURT-EGGEN-SELZBURG-BASEL, with connecting lines from the Italian border."

1. MAP OF SYSTEM

Add "A further diagram has been prepared covering the supplementary routes described—see Plan 1."

2. GENERAL DESCRIPTION OF SYSTEM

For "KARLSRUHE" read "KARLSRUHE" and add the following to the list of Railway divisions:
ERFURT REGENSBURG INNSBRUCK

Add "The supplementary routes will cover principal routes running N. from Switzerland and Italy, and E. to Czechoslovakia, and Austria."

3. ORGANISATION AND PERSONNEL. (a) Organisation.

Para. 1. After German State Railway insert "See Plan 2 for diagram of Reichsbahn organisation."

Page 4

Para. 4. State Railway Divisions.

After "NÜRNBERG" delete divisions and add "Erfurt, Regensburg and Innsbruck divisions."

Para. 9. District Operating and Engineering Offices. Add "District traffic matters are centrally controlled from the district."

Para. 11. Main Railway Repair Shops. At end of para. add "The Ausbesserungswerke in the area covered by this report are at Stuttgart and München."

Page 5

State Railway Central Office (Reichsbahn Zentralämter). Delete existing para. and substitute the following:

"The building and maintenance of rolling stock at the disposal of the German Railways (including Occupied Countries) is directed from the Reichsbahn Zentralämter (R.Z.A.), which also deal centrally with the question of stores, purchases, technical design and development for the whole of the Reichsbahn. There are two of these Central Offices, one at Berlin and the other at Munich."

The internal organisation of each RZA is as follows: chairman, deputies, and auxiliary personnel.

Matters concerning wagon building are in the hands of a Hauptwagenamt—Berlin.

The Berlin RZA has the following experimental offices:

1. For locomotives and motorised wagons—Grünwald.
2. For brake testing and research—Grünwald.
3. For wagons—Grünwald.
4. Chemical—Brandenburg-West.
5. For testing bearings and castings for bearings—Göttingen.
6. For energy and heat economy—Tempelhof.
7. Chemical in Munich.
8. Mechanical in Munich.

In addition, the RZA Berlin is over the following offices:

The RZA Berlin office for street vehicles and traction machines in the garage on the Markgrafendamm.

Reception offices of the Reichsbahn:

BERLIN I	DRESDEN	MANNHEIM
BERLIN II	HAGEN	MÜNCHEN
BRESLAU	KÖLN	WIEN
DOFTMUND		

Coal reception offices in Essen and Gleiwitz.

Matters pertaining to the construction of new railway rolling stock are attended to direct by the Central RZA Offices.

Railway repair workshops are under the supervision of the RZA offices through the intermediary of the Generaldirektion d. Werkstätten (GDW). There are 10 of the latter and each of them has a group of workshops subordinated to it.

Generaldirektion d. Werkstätten:

BERLIN	HAMBURG	MÜNCHEN
BRESLAU	KÖLN	STUTTGART
DRESDEN	KÖNIGSBERG	KASSEL "
	(Pr)	

After para. 10 insert the following:

"Electrical Administration Office (Elektrische Oberbetriebsleitung)"

The administration of all electric traffic matters, power stations, and railway transformers, is directed

from Innsbruck the regional managements being as follows:

Traffic (Electric Management)—

MITTELTEISE (RDB Breslau)
MULDENTZEN (RDB Halle)
MÜNCHEN-PASING (Route 122)
INNSBRÜCK (Route 121/3)

Power and Transformer stations are given under Section 7.

State Railway Construction Divisions (Reichsbahndirektion)

All road and building construction in the Reichsbahn is directed from two Reichsbahndirektion, one at München and the other at Berlin.

The München establishment consists of 27 offices, of which 1-19 control building, whilst the remainder deal with machinery and technical matters."

(b) PERSONNEL

After Reichsbahn (line 2) add "as a whole."

Page 6

4 (a) Add at end of paragraph:

"The lengths of individual routes dealt with in this report are given in the preamble to each line description."

(b) LOADING AND STRUCTURE GAUGE.

Structure Gauge: Lines 4, 6, 8, delete "Maximum" and substitute "Minimum."

Add the following paragraph:

"The structure and loading gauges for the Austrian Lines are the same as for the German lines."

Page 8

5 (a) "width of rail" should read "weight of rail."

Add "For sectional diagram of the standard S.49 rail see Plan 3."

5 (b) Add "For drawings of rail fastenings and permanent way components see Plans 4 and 5."

5 (c) Add "For sectional drawing of 'K' pattern permanent way on steel and wooden sleepers see Plans 5 and 6."

(d) Add "For sectional drawing of double and single track formation see Plans 7 and 8."

(e) "1929 3683" should read "1929 3383."

Para. (g), (f), and (h) should be (f), (g), and (h)

Page 9

Section 5 (i), add note "see Section 15 on Mountain Railways" (C/317A, p. 4).

6 (b) SIGNAL TYPES AND ASPECTS.

Para. 2, line 1. Delete "advance signals" to "disc type" and substitute "Distant signals (Vorsignale) are of disc type."

Lines 14 and 20. Delete "advance signal" and substitute "distant signal."

After para. 3 add "For various types of signals and their aspects see Plan 9."

Page 10

Para. 3, line 11. Delete "advance" "distant" signal" and substitute "distant signal."

(v) ELECTRIFICATION. Delete whole section and substitute the following:

"In 1937, the Reichsbahn system included the following total length of electrified lines:

Route length—	Km.
Single Track	599
Double Track	1,639
Multiple Track	25
Total	2,263

Of the lines described in this report, including supplementary routes, the following are electrified:

Route

- 82. STUTTGART-MÜNCHEN
- 83. AUGSBURG-TRAUCHTLINGEN
- 87. NÜRNBERG-TRAUCHTLINGEN
- 101. NÜRNBERG-HOCHSTADT-MARKTZEULN
- 106. MÜNCHEN-REGENSBURG
- 124. SALZBURG-RÖSENHEIM
- 110. BASEL-LORRACH-SCHOPFHEIM
- 111b. FREIBURG-NEUSTADT
- 111c. TITISEE-SALZBURG
- 115. TÜBINGEN-PLÖCHINGEN
- 121. LINDAU-INNSBRÜCK
- 122. INNSBRÜCK-PARTENKIRCHEN-MÜNCHEN
- 123a. BRENNER-INNSBRÜCK-KUPFSTEIN
- 123. KUPFSTEIN-ROSENHEIM-MÜNCHEN
- 124. WÖRGL-ST. JOHANN-SALZBURG
- 125. SPITAL MÜLLSTÄTTESSEE-SCHWARZACH ST. VEIT

Power for German lines is obtained from Hydro-electric stations which, in most cases, do not belong to the Reichsbahn but are State owned and also supply industrial establishments in the areas. With the exception of the lines in the Titisee area, current is supplied by overhead transmission on the standard system for German railways, i.e. 15 kV a.c. 16 2/3 cycles single-phase. The Höllental and Dreiseen Railways (Titisee) areas are supplied by power from the general supply system of the country (20 kV single-phase 50 cycle) by means of Scott connected transformers; transmission, as in the case of the other lines, is by the overhead method. Illustrations of overhead equipment in various areas are given in photographs 1-8.

The following is a list of the principal power stations:

(i) München Area:

- (a) Walchensee power plant—situated south of München, near Garmisch head, with Walchensee lake as water storage basin; 2 single-phase sets, each of 10,650 kVA.
- (b) Mittlere-Isar group of power plants—situated north-east of München: 4 single-phase sets of 12,000 kVA each, installed at the Eitting and Aufkirchen power plants; one transformer set of 10,000 kVA installed at Pfrombach power plant

(ii) Salzburg Area:

- (a) Saalbach power plant, near Bad Riechenhall.
- (b) Gartenau power plant, near Schnellenberg.
- (c) Mallnitz (Route 125).

(iii) Stuttgart Area:

- Munster power plant.

(iv) Basel Area:

- Ryburg-Schwarstadt (Route 110).
- Rheinfelden (Route 113).

(v) Innsbruck Area:

- Rast.
- Achensee (Route 121).

The principal sub-stations are as follows:

Route	
82.	Stuttgart, Neu Ulm, München (Pasing)
85.	Meitingen
87.	Grönhart, Nürnberg
105.	München-Pasing, Landshut
124.	Trautwein Rosenheim
111b and c.	Titisee
115.	Stuttgart
121.	Darufen, Flirsch, Roppen, Ziel, Feldkirch
122.	Murnau, München-Pasing
123.	Rosenheim, München-Pasing
123a.	Mairei, Hall, Wörgl
124.	Wörgl, Kitzbühel, Saalfelden, Schwarzach-St.-Veit, Golling
125.	Mallnitz, Schwarzach-St.-Veit

The standard sub-station on the German State Railways comprises static transformers at 5,000-6,000 kVA and the average distance between sub-stations is from 50-60 km. Voltages of transmission from the power stations to the sub-stations are between 8 kV and 10 kV."

Page 12

(8a) Insert at end of section "Illustrations of German steam locomotives, and schedules giving more detailed information on steam locomotives, are given in Plans 10-14. A schedule of leading particulars of electric locomotives is given in Plan 15 and illustrations of certain types in Photographs 4-6a."

Page 14

(8c) Insert "A revised list of locomotives depots is given in C/317A, p. 17, Table 1."

Page 15

(8c) Add "For revised list of Railway Workshops see C/317A, p. 19, Table 2."

Page 16

After 8th paragraph insert, "For illustrations of German State Railways Passenger Rolling Stock see Plan 16."

Page 19

After 2nd paragraph insert: "For illustrations of Freight Rolling Stock see Plans 17-17c."

(9b) BRAKING EQUIPMENT

Para. 2 add: "Plans 19 and 20 give the layout and details of the Kunze-Knorr (Kkg) and the Hildebrand Knorr ("L.kg") goods brakes."

Para. 3 add: "Plan 18 illustrates the type of temporary fitting for unfitted vehicles, together with the method of fixing."

Para. 4 for "caboose" substitute "brake castle," and add "for illustration see Plan 17c."

(9c) BUFFING AND DRAW GEAR

Para. 1 add: "Plan 22 illustrates both types employed."

Para. 2 add: "For illustration see Plan 21."

Para. 3 add: "See Plan 23."

(9d) ROLLING STOCK WORKSHOPS

Add: "for revised list of workshops see C/317A, p. 19, Table 2."

Page 20. Traffic

(12a) Add: "The following statistics given by Dr. C. G. Müller, Secretary to the German Min."

try of Transport, in his speech on 7th December, 1943, illustrate the increase in traffic experienced by the Reichsbahn since the outbreak of war.

	1932	1938	1943
Passenger traffic	millions	millions	millions
No. of passengers, excluding forces	1,305	1,975	3,400
Passenger/Km.	20,811	56,123	83,428
Goods traffic			
Net ton/km.	44,410	88,525	52,591
Axle/km.	13,499	23,391	34,595
Train/km.	191	314	477
Wagons placed	31	45	45

(10b) WEIGHTS AND SPEEDS OF TRAINS

Para. 3, line 3. Delete "The average" to "net" and substitute: "The average main line goods train in war-time may be taken as carrying at least 500 tons net."

Add after para. 5: "The following regulations regarding maximum speeds applied in 1929, and although, as indicated in the preceding paragraphs, improvements to track and rolling stock since then may have allowed for higher speeds for certain classes of train, the basic principles can be taken as still applicable:

	Main line m.p.h.	Subsidiary m.p.h.
(a) Passenger Trains		
(i) Without automatic brakes:		
Composed of Goods stock with 1 brake	31	22
Mixed stock for gradients not steeper than 1/100	18.5	18.5
Mixed stock for gradients steeper than 1/100	12.5	12.5
For gradients steeper than 1/50 and for more than 1 km., trains must stop at summit and thence after every km.		
(ii) With automatic brakes:	62.6*	22.0
When lines and stock are suitably equipped		31.0
When lines and stock are suitably equipped and passed by inspecting authority		34.0
(b) Goods Trains	31.3	22.0
With air brakes	40.5*	
(c) Works Trains	28.0	
(d) Light engines (unless otherwise ordered)	31.3	
Light engines tender first	26.0	
(e) Filling Gradients		
1,1000	68.3	
1,200	65.0	
1,100	56.0	
1,40	35.0	31.0
1,25	—	12.5
(f) Carriage limits		
1,200 m.	72.0	
700 m.	56.0	
500 m.	50.0	
300 m.	40.5	
200 m.	31.3	31.0
180 m.	28.0	23.0
160 m.	—	17.5

Other general speed restrictions are as follows:
18.5 m.p.h. for all trains on subsidiary lines,
and for goods and military trains on main
lines.

28.0 m.p.h. for stopping and passenger trains,
rail motors and light engines on main lines.
15.5 m.p.h. when propelling on main lines.
10 m.p.h. when propelling on branch lines
and all crossings are not protected.

Trains banked in rear must not exceed 37.5
m.p.h. and if the automatic brakes fail and the
train is worked by hand brake, 31.3 m.p.h. may
not be exceeded on main lines, or 22 m.p.h. by
goods trains on subsidiary lines."

Page 11

For revised list of Marshalling Yards see C/317A,
p. 20, Table 3.

12. VULNERABILITY OF SYSTEM

Add after para. 1:

"The density of the railway network is not so
apparent as one proceeds E. and S., where, al-
though alternative routes still apply, the use of
them entails considerably greater train kilometrage
than obtains on the direct routes, and the cutting
of lines at selected junction points can cause con-
siderable inconvenience in maintaining communi-
cations to France, Austria, and Italy.

Key junctions are given in the preamble to each
line description and in the case of the supple-
mentary routes are indicated, together with other
particularly vulnerable points, by an asterisk in
the text."

Page 24

**12c. ELECTRIC RAILWAY POWER STA-
TIONS AND INSTALLATIONS**

Add: "The power stations serving the supple-
mentary lines are referred to in Section 7."

**12d. TRAFFIC CENTRES AND MARSHAL-
LING YARDS**

Add: "A revised list of Marshalling Yards is given
in C/317A, p. 20, Table 3."

14. ITINERARIES

List of Abbreviations.

Add mg = maximum gradient

mr. = minimum radius of curves "

Last line, delete "beginning" and substitute "end,"
and add: "a map indicating all routes described,
including supplementary routes, is given as
Plan 1 of C/317A."

Add the following paragraph: "Map sheets of
G.S.G.S. series 4081 and 4416 have been used
in line descriptions."

After Section 14, add the following:

"(15) MOUNTAIN RAILWAYS

The railways in S.W. Germany run through the
mountainous regions of Bavaria, Wurtemberg and
Baden, so that many steep gradients are encoun-
tered. Gradients are as much as 1/25 on the
electrified line between Bad Reichenhall and
Berchtesgaden (see Route 109), 1/40 at Neuenmarkt
(Route 101), and also on the Munchen-Berlin main
line, between Hochstadt and Probstzella (see also
Route 101), 1/45 on the Geislingen gradient (Route
25), and 1/40 between Schweinfurt and Erfurt
(Route 100), all of which are routes for main line
services.

In addition there are local lines serving the
mountainous districts where, although speeds are
of the very moderate, important through trains
are frequently carried and a few there have been

necessary for the line to make considerable detours
to avoid prohibitive gradients. An outstanding
example is to be found on Route 112a between
Weizen and Blumberg, where the distance as the
crow flies is only c. 10 km., and the line makes a
detour of 25.5 km.

On the Black Forest Railway (Route 112), in
spite of its 1/50 gradients, it is necessary for the
line to cross the central range by a double spiral
and a helical tunnel between Hornberg and Nuss-
bach, to make good the difference in altitude of
300 m.

The Murgtalbahn, branch of the Black Forest
railway, has a maximum gradient of 1/20 between
Hausach and Freudenstadt, and the 0-10-0T
locomotives employed on this line can haul only
3 or 4 four-wheeled vehicles.

Endeavours have been made to improve servi-
ces on mountain lines by the introduction of appro-
priately designed locomotives for fast trains, and
as a result the 4-8-4 type has been brought into
operation, designed for a speed of 140 km. (87
m.p.h.). In addition, the dead weight of rolling
stock has been considerably reduced on those lines.

The 2-10-2 tank locomotives, used *inter alia* on
the Hollenthal Railway, enable high speeds to be
maintained on lines of heavy gradients and sharp
curves, and can be operated over curves of 100 m.
(5 chains) radius. The flexibility is obtained by the
use of Luttermöller axles or Schwartzkopff-
Eckhardt trucks. An example of a 2-10-2T Class
locomotive is given in photograph 32.

(a) RACK RAILWAYS

(i) The Baden-Hollenthal railway was origin-
ally constructed for rack working over the steepest
gradients, but the introduction of the 2-10-2 tank
locomotives and electric traction has enabled the
rack system to be abandoned.

Gradients on the adhesion section reach as much
as 1/40, and the minimum radius of curves is
300 m. (15 chains), whilst on the old rack sections,
which may have been improved upon electrifica-
tion, the figures were 1/18, and 260 m. (13 chains)
radius respectively.

(ii) The Ilmenau-Schleusingen (Thuringer-
wald) Railway, a local line with connection to
Route 101a, comprises 30 km. of standard gauge
adhesion railway and 5 sections, a total length of
6,240 m., of Abt rack railway, with maximum
gradients of 1/40 and 1/17 respectively, and curves
of 250 m. and 200 m. radius.

(iii) The Bavarian Wegscheid Line, between
Erlau (near Passau) and Wegscheid has 1,610 m.
(1 mile) of rack railway in 2 sections.

(iv) The Reutlingen-Schelklingen line con-
necting Routes 115 and 116 has, between Honau
and Lichtenstein, a rack section of 1,990 m. (1.24
miles), and speeds are restricted to 10 km. per
hour both up and down.

In addition there are 2 rack railways constructed
purely for tourist traffic, one between Stuttgart
and Degerlock, and the other from Braunenberg
(Route 123) to Wendelstein. The latter climbs
from 472 to 1,790 m. (1,548 ft. to 5,873) above
sea level.

Photograph 33 gives leading dimensions of
German rack locomotives.

AERIAL CABLEWAYS

In both Germany and Austria cableways have
been developed for passenger traffic, although the
earliest were constructed for goods only.

The general principle is that vehicles are sus-
pended on a carrier cable and drawn up by a
traction cable. High speeds are attained, that

of the Kreuzschnabel and Wankbahn near Paternkirchen, Route 122) and the Prediger Bahn (near Bad Reichenhals) (see photographs 13-14) being 5 m. per second. The Zugspitze, the highest peak in the Bavarian Alps, is served by two cableways (telpher lines), one from the German side and one from the Austrian. The German includes a one-metre gauge adhesion railway from Garmisch to Grainau (5.8 km.), with gradients of 1/27, and a rack section thence to Schneefernerhaus, with gradients of 1/4 and a 4,45 m. tunnel.

The Nebelhornbahn, which runs from Oberstdorf in the Kempten area, climbs from 843 m. to 2,969 m. above sea level, and is one of the longest in the world.

Photograph 34 illustrates profiles of certain German telpher lines.

The Austrian cableways, of which there are twelve, have a total length of 30 km. (18.6 miles), and a total height of 11,050 m. (over 11½ miles), and in normal times carry about a million passengers yearly. Most are built on the Zuegg system which gives a long distance between supports, and by the use of high-tension cables enables high speeds to be attained. Speeds are up to 4.5 m. (14½ ft.) per second, and as a rule double lines are provided, allowing two vehicles to be employed, one ascending and one descending. Installations are provided in some cases enabling additional vehicles to be attached or detached as required.

The most recently constructed is the Galzig line, opened in 1937. The length is 2,600 m. (2,843 yds.) rising through 77 m. (842 yds.). The cables have a tensile strength of 200 kg. per sq. mm. (127 tons per sq. in.) and the factor of safety of load to initial tension is 3.5 for the carrier and 4.5 for the traction cable. The cable is 37 mm. (2½ in.) in diameter, and speed reaches 6 m. (19.7 ft.) per second, the journey occupying 7½ minutes. The cars carry 30 passengers each and the hourly capacity is 200 passengers in each direction, the greatest capacity of all Austrian lines.

The high degree of safety experienced on all the Austrian cableways has led to the elimination of safety-catch devices, allowing for higher speeds.

Photographs 20 and 21 indicate the location and altitudes of the Austrian cableways and photographs 15-17 illustrate specific examples.

FUNICULAR RAILWAYS

There are two funicular railways in the Innsbruck area, the Nordkette and Hungerburg lines, illustrations of which are given in Photographs 18-19.

Page 25

Route 51. In list of MY add "Apach (Moselle)" and "Konz-Karthaus."

0 km.

Apach. Under details and facilities add "MY—E. of station—group of LS average length 850 m."

Page 26

39.9 km.

After "long" add "line continues 4 track."

40.2 km.

Delete "c. 200 m. long" and substitute "4 parallel ST bridges, each c. 106 m. long and 4 spans."

40.3 km.

41.3 km.

Delete "Bridge over Moselle c. 300 m. long, 3 spans" and substitute:

"Bridge over Moselle, c. 7 spans, total length c. 100 m."

40.9 km.

Delete "Flyover" and substitute "Railway over-bridge," and in details column add "2 parallel ST bridges."

42.7 km.

KARSTHAUS. Delete "SER" to "Tb1," and substitute:

"Loco Depot. E. of J for Ehrang line. ES (½ RH) capacity c. 30 locos. Tb1 (20 m.). W. Small ES (RH), probably for tank locomotives for yard working."

725 for goods wagons, S. of Loco. Depot.

MI N. of Loco. Depot, c. 20 LS c. 500 m. long.

Passenger Station, N. of MY, 3 island platforms.

Goods Yard, SER.

For diagram of Konz-Karthaus see Plan 29."

49.5 km.

TAIRA. Under facilities delete "ES (small RH)" and substitute "ES (rectangular) combined with RpS, Tb1. W. For location diagram of Trier see Plan 30."

Delete "J facing right with ST s.o. line to Bullay" and substitute:

"Trier (Moseltalbahn). W. of line and N. of Trier Hbf—terminus station for ST standard gauge light railway to Bullay—distance to Bullay 102.0 km."

52.0 km.

Insert "J facing right with ST s.o. line to Turkismühle."

52.1 km.

Under Engineering Works, insert "Bridge over railway," and under details "Line passes over ST light railway to Bullay."

Page 27

55.7 km.

EHFRANG. Add "for location diagram see Plan 30." Delete "2 ES (medium) RH? removed," and substitute "1 ES RH, capacity 20-25, 1 Tb1 (c. 20 m.)—a further Tb1 lies S. of engine shed, the engine shed connected therewith having apparently been removed; radial tracks remain."

Page 29

159.9 km.

Koblenz (Moselle). After "ES (large) RH" insert "c. 50 locos."

161.1 km.

After "Koblenz" add "(Hbf)." After "ES (small) RH" insert "c. 15-20 locos." Add "For location diagram see Plan 30 and for air photograph, Appendix 11."

Page 30

0 km.

Koblenz. Delete "MY" to "ES" and substitute: "Passenger Station, 3 platforms (island)."

Goods Station. S. of passenger station—small group of DES. SR.

Loco. Depot. S. of goods station, ES RH, capacity 15-20. Tb1. W. See also Route 51 Koblenz (Moselle).

MI at Koblenz (Lautzel) and F. blenz (Moselle) see Route 51.

See Location Diagram, Plan 30."

Page 32

116.7 km.

Frankfurt-Griesheim m. Insert in details column "ES (rectangular), c. 160 m. x 100 m., served by c. 12 through tracks."

Between 117.4 and 118.0 insert under Engineering Works "Railway overbridge, carrying DT connection from MY and Frankfurt Hbf."

121.2 km.

After "Route 53" add "See Appendix 17 and Plan 26."

Page 33

General Details. Insert under MY "Koblenz (Moselle) and Koblenz (Lutzel)" and under Engine Sheds "Koblenz Hbf, Koblenz (Lutzel), Koblenz (Moselle)."

0 km.

Koblenz Hbf. Insert in details column "Locomotive Sheds at Koblenz Hbf, Koblenz Moselle, and Koblenz Lutzel, also MY at Moselle and Lutzel—see Route 51."

For location diagram of Koblenz see Plan 30."

Page 34

4.6 km.

Niederlahnstein. Delete "10-3" and substitute "10-15."

6.5 km.

Oberlahnstein. Delete "20-3" and substitute "20-25."

34.2 km.

St. Goarshausen. Delete "J (facing) left, light railway to Nastätten" and substitute "I with 1 m. gauge light railway to Nastätten (16.9 km.) and Zollhaus (44.3 km.)."

58.4 km.

Delete "Rack and pinion railway to Niederwald."

63.1 km.

Rüdesheim. Insert under facilities "I with rack and pinion railway to Niederwald."

63.9 km.

64.9 km.

Delete all four lines in details column and substitute:

"J (triangular) right with DT line to Kreuznach (Route 59)."

Page 35

96.2 km.

After Zollhaus add "and Wiesbaden W. and Hbf."

93.3 km.

Wiesbaden Hbf. Add "for location diagram of Wiesbaden see Plan 43."

96.8 km.

After MY add "J trailing right with show from Wiesbaden—Biebrich-Rhein Station."

98.3 km.

Under Engineering Works insert "2 railway overbridges." After "Hochst line" in details column insert "J trailing right with ST connection from Wiesbaden Hbf—Mainz line."

100.1 km.

Mainz-Kastel. Under facilities insert "ES, RH, TBL, W."

102.4 km.

After Biebrichheim insert "Line runs 4-track, followed by J facing right to Biebrichheim."

102.1 km.

Substitute for "Bridge under Mainz line," "Railway overbridge," and insert under facilities "Line passes under connection from Biebrichheim."

102.1 km.

Delete "Hocenheim" and substitute "Hochheim."

Page 36

130.7 km.

Delete "J (facing)" to "(8.5 km.)" and substitute "J (triangular) left with ST s.o. line to Frankfurt Rodelheim and Kronberg; distance to Kronberg from Frankfurt Hbf—16.1 km.; also facing connection left to main goods station."

134.5 km.

FRANKFURT (MAIN). Delete "SER" to "TbIs" and substitute:

"Passenger Station. One of the few 'terminus' stations in Germany. 13 platforms (covered) c. 400 m. long."

Loco. Depot. W. of station. ES rectangular. 2 TbIs (25 m.). W."

Main Goods Station. SER Wb (511) Cr (251) 1 large goods shed served by 10 DE tracks. 12 DES (c. 800), 6 with road access."

Loco. Depot. W. of goods yard—2 ES, 1 RH type (total capacity c. 50), W. A further Tbl was reported to be under construction in October, 1943."

RpS. (Passenger and Goods Rolling Stock.) Total employed 2,300—served by c. 20 DE tracks."

MY. Capacity 2,700 per 24 hours:

Reception Sidings: 8 LS (c. 600 m. each).

Sorting Sidings: 22 LS (c. 700 m. each).

Storage Sidings: 7 DES (c. 700 m. each).

FRANKFURT NIED (Route 52). RpS. Loco.

FRANKFURT Griesheim (Route 52). ES, rectangular, served by c. 12 through sidings, and measuring c. 160 m. x 100 m."

FRANKFURT OST (Route 86). MY, capacity 2,800, and Loco. Depot."

For location diagram see Plan 26, and annotated air photographs, Plan 26a and 26b."

Page 37

0 km.

KOBLENZ. After "SR" insert "For location diagram see Plan 30."

Page 39

63.6 km.

GAUJAHNHEIM. Delete "J (trailing) right" to "line" and substitute "69.3. J trailing right with DT s.o. line from Bad Munster (Route 60)."

Insert kilometrage for bridge over stream—"70.1 km."

70.3 km.

GAUJAHNHEIM. Under facilities insert "J for R. S.—DT s.o. line from Bad Munster and Saarbründ."

72.3 km.

Flörsheim. Delete "Dead end" to "(21.5 km.)" and substitute "Line passes under ST s.o. line from Flörsheim R. s. s. to J. s. s. line."

91.7 km.

MAINZ (Main Station). Under facilities add:
"Passenger Station. 3 platforms (2 island) c. 300 m. long, 6 through tracks."

Goods Yard. c. 12 DES each 200 m. long, 18 with road access. Large goods shed c. 300 m. long.

W. of shed small group of c. 10 LS up to 300 m. long.

Shunt Yard. N. of goods yard c. 16 LS c. 500 m. long.

93.7 km.

MAINZ Süd. Insert "Passenger Station, with 2 platforms c. 300 m. long (one island), served by 4 through tracks. For location diagram of Mainz see Plan 43."

Page 40

127.6 km. to read 126.1 km.

79½ miles to read 78½.

129.2 km.

FRANKFURT (Main). For details of facilities see Amendments for Route 53.

Page 42

0.6 km.

Bridge over R. Sauer. Add under details "4 spans, masonry construction."

10.3 km.

TRIER (West). Add "RpS, carriage and wagon, S. of station W. of line—equipped with traverser; for diagram see Plan 40—total employed including staff at Konz Karthaus and Trier Loco. RpS, 1792."

Delete reference to RpS, goods and passenger stock on Page 26 Trier Hbf.

Page 43

15.9 km.

EHRANG. Delete "2 ES medium RH: but 2 removed" and substitute "1 ES, RH, capacity 20-25, 1 Tbl (c. 20 m.); a further Tbl with radial tracks lies S. of existing ES, but the "H" in connection therewith has apparently been removed."

For location diagram see Plan 40."

Page 44

0 km.

TRIER. Reference RpS, delete "passenger and goods" and add "RpS, carriage and wagon, at Trier W., equipped with traverser; for diagram see Plan 40, for location diagram of Trier see Plan 40."

Delete "DT line N. to EHRANG" to "EHRANG" and substitute "J for DT line from Apach-Ehrang-Koblenz (see Route 51), also ST line to Hermeskeil and Turkismühle. Separate station (Moseltalbahn) W. of line and N. of Hbf, for ST standard gauge light railway to Bullay."

11.7 m.

TRIER (Süd). Delete "Restricted Goods facilities" and substitute "Passenger station only, 2 platforms (island)."

Page 45

6.7 km.

KARTHAUS. See Amendments for Route 51.

Page 46

83.3 km.

After "Circle (3 km.)" add "also connection to RpS (Goods wagon)."

85.8 km.

SAARBRÜCKEN-BARBACH. Under facilities add:

"Passenger Station. 2 platforms (1 island) c. 330 m.

Shunt Yard. N. of station c. 16 LS 350-400 m.

RpS. (Carriage and Wagon). N. of station served by ST line at 85.3 km., fitted with traverser and machinery for heavy repairs—total employed normally 3,000."

87.2 km.

After "Remelach" add "(Route 52)."

87.8 km.

After "Neunkirchen" add "(Route 63)."

88.3 km.

SAARBRÜCKEN (Hbf). Delete "SER" to "destroyed" and substitute:

"Passenger Station. 5 platforms (4 island).

Loco. Depot. N. of station.

RpS (Loco). N. of passenger station—total employed c. 1,200. Tbl (c. 23 m.) W.

Small RH at W. end probably for tank locomotives, capacity c. 15 locos.

RpS (Carriage and Wagon). N. of Burbach Station, served by ST connection from main line at 85.3 km.

MT. Hump type on main line to Neunkirchen (Route 59).

c. 30 LS for marshalling, c. 700 m. long, also c. 20 LS for reception and departure. Capacity c. 2,500 wagons per 24 hours.

Loco. Depot at MT. ES, rectangular capacity, c. 50 locomotives. Tbl (23 m.) W.

Shunt Yard at Schleifmühle (Route 63). 10 LS c. 300-600 m. long, also ES (RH) capacity c. 15 locos. Tbl (c. 18 m.) W.

Goods Station. SE of passenger station. SER. Wh. (40 tons). Cr (20 tons).

Small group of c. 8 LS c. 370-400 m. long.

N.B. Owing to the heavy bombing suffered at Saarbrücken the capacities of the various installations are probably greatly reduced.

For location diagram of Saarbrücken see Plan No. 37."

Page 48

For details of facilities at Saarbrücken see Amendments to Route 56.

Page 54

Under Engine Sheds insert "HARGARTEN."

0 km.

HARGARTEN. Insert the following under details and facilities:

"Continuation of DT main line from Metz and Paris. Frontier Station.

SER. Wh. Cr.

Loco. Depot. In junction triangle formed by Hargarten-Beningen, and Hargarten-Völklingen lines.

ES. (RH) holding capacity c. 24 locos; maintenance capacity 75-100 locos; 24 roads.

Tbl (20 m. diameter) W.

Small workshops attached with fitting shop.

Mechanical coating plant.

J for lines E. to Saargemünd, W. to Luxembourg and S. to Metz and Paris."

Page 55

Under ES add "St. WENDEL—RpS locn."

0 km.

BENNINGEN. Under facilities add "W. Through industrial sidings (800 m. long) serving MARLBACH coal mines N. of station."

Page 56

16.9 km.

For details of facilities at SAARBRÜCKEN see Amendments for Route 55.

Page 57

38.2 km.

NEUNKIRCHEN. After "RH" insert "capacity 45-50 locos."

66.5 km.

After "Nonweiler" insert "(Route 57)."

Page 60

Under ES and MY add "SAARGEMÜND."

0 km.

SAARGEMÜND. Delete "SER. Wb. Cr." and substitute "See p. 74 for details."

0.9 km.

Bridge over SAAR, insert in details column "2 spans over road and at least 5 girder spans on masonry piers over river."

Page 61

40.3 km.

HOMBURG W. Delete reference to ES.

41.8 km.

Amend details to read "J trailing left with DT s.o. line from Neunkirchen, also connection from MY."

42.2 km.

Amend details to read:

"J trailing right with DT s.o. line from Zweibrücken (Route 62)."

43.0 km.

HOMBURG. Delete "SER" to "MY" and substitute: "Passenger Station. 3 platforms (2 island) c. 300 m.—4 through tracks.

Goods Station. S. of passenger station.

SER. Wb (40 tons).

3 DES (c. 300) to goods shed, c. 3 DES (300-500 m.).

Shunt Yard. N. of passenger station, c. 12 LS (500-750 m.).

Loco. Depot. W. of passenger station in J triangle. ES RH, holding capacity c. 15 locos.

1 Tbl (20 m.). W. Shed served by 2 tracks which also serve coal stage. N. of ES c. 4 DES c. 250 m. long with spurs to storage area, probably for engineers' materials.

MT. Connections from Homburg Altstadt (Route 63) and Homburg W.

c. 10 LS c. 600 m. long.

c. 20 DES c. 350 m. long.

2 ES, RH, total holding capacity c. 50 locos.

2 Tbl (c. 25 m.) W. Small workshops attached. Avoiding line from MY at rear of Loco. Depot."

57.5 km.

Delete "Humburg" and substitute "Homburg."

Page 62

KAISERSLAUTERN. Delete "SER" to "24 hours" and substitute:

"Passenger Station.

1 island platform c. 700 m.

1 single faced platform c. 700 m.

2 lays at E. end and 2 at W. end, each c. 300 m. and served by 2 DE tracks.

6 through tracks.

Goods Station. S. of passenger station.

SER. Wb (40 tons). Cr (6 tons).

6 through running tracks between island platform and shed, c. 800 m. long.

Goods Shed. Covered space c. 270 x 30 m. served by 2 through tracks—total area of loading platforms, including covered area, c. 450 x 40 m.

c. 4 DES with road access each c. 400 m.

MT. S.W. of passenger station.

c. 6 LS c. 700 m. long, with shunt spur at S. end c. 180 m.

12 DES c. 400 m. Engine run-round (at least DT)—W. of yard.

Storage Sidings. N. of main running lines, c. 4 LS. c. 400 m. long, with connections at E. end to electricity works and RpS.

Repair Shops (RpS). N. of passenger station—served by 12 DES, also 4 DES for storage c. 300 m. long. Total employed 1,227. Equipped to deal with repairs to locos. and goods wagons.

For diagram of layout of RpS see Plan 58a, and for location diagram of Kaiserslautern plan 58."

Page 62

Insert:

87.1 km.	Station	Facilities
	"ALTHOCHPEYER	SER. Wb (35 tons)."

88.9 km.

HOCHPEYER. Insert "see p. 71 for details."

"J triangular—Neustadt." After Neustadt add "Route 65," and insert kilometrage 89.0 km.—89.5 km.

After ENKENBACH insert "95.4 km. J (flyover) left with ST s.o. line to Grünstadt (distance 26.3 km.). 95.9 km. Railway overbridge. Line passes under ST s.o. line to Grünstadt."

104.8 km.

After "Frankfurt" insert "(Route 64)."

Page 65

9.1 km.

HOMBURG. For details see Amendment for Route 60, h. 61.

Page 66

58.4 km.

After "Kaiserslautern" add "(Route 64)."

Page 68

Under Vulnerable Points add:

"Junctions at 0.8, 1.4, 17.0, 25.3, 25.8, and 37.5 km.

Bridges at 3.9, 28.2, and 30.0 km.

Tunnel at 16.5 km."

0 km.

Saarbrücken. For detailed facilities see Amendments to p. 75 and for location diagram Plan 57.

Page 69

58.2 km.

Delete "Bridge over R. Nies" and "Bridge over main road" and substitute "Bridge over R. Nies and main road."

Insert:

"300 km.

Bridge over R. Nies."

34.7 km. Delete "Altstadt," substitute "Altstadt."

30.8 km.

For details of facilities at Housburg see Amendments to p. 61.

Add "J for Route 60 to Kaiserlautern and Badmünster, and Route 59 to Turkismühle, Badmünster, Bingerbrück and Mainz, also Route 60 to Saarbrücken and Saargemünd, and Route 60 to Bierbach.

Page 70

0 km.

Kaiserlautern. For details of facilities see Amendments to p. 61.

33.4 km.

LAUTERBACH-GRUMBACH. Add "Line continues N. DT to Badmünster as Route 60."

General details. Add "NEUSTADT" to list of MY.

Page 71

0 km.

Kaiserlautern. For details of facilities see Amendments to p. 61.

1.7 km.

"J (facing) left with DT" to read "J (facing) left with ST s.o. line to ENKENBACH, junction for Route 60 to BADMÜNSTER—distance to ENKENBACH 13.2 km."

Insert "9.6-10.1 km.—J (triangular) left with DT s.o. line to BADMÜNSTER (Route 60)."

8.7 km.

Delete "Altochspeyer" and substitute "ALTHOCHSPEYER."

9.5 km.

Hochspeyer. Add following details:

"Passenger Station. 4 through roads.

2 Tbl (1 x 16 m.).

Stabling Sidings. Right of line, 4 LS (644, 577, 336, and 322 m.)."

32.4 km.

NEUSTADT. Add following details:

"Passenger Station.

3 through roads.

Loco. Depot.

1 ES, RH, W. of station. Tbl (20 m.).

1 ES in J triangle, maintenance capacity 67 locos.

Tbl (16 m.). Turning triangle. W—: towers of 230 m., one feeding at rate of 15 m.³ per hour, and the other 10 m.³ per hour.

Stabling Sidings.

In J triangle 11 LS (330-850 m.).

Left of line to LANDAU—8 LS 174-299 m."

Page 72

190 km.

After "Gernsheim" add "(Route 59)."

47.5 km.

SCHIFFSTADT. Add "For further details see p. 54."

51.6 km.

LUDWIGSHAFEN. For details of facilities see Route 58, and for location diagram Plan 31.

Pages 72 and 73

For location diagram of MANNHEIM see Plan 31, and for further details of facilities see Route 55.

Page 74

SAARGEMÜND. After "RH" insert:

"Total holding capacity of ES = 60.

Tbl 2 x c. 14 m., and 2 x c. 24 m."

Delete "2 Tbl."

Storage Sidings. Delete "10-15 short DES" and substitute "10-15 short LS."

Page 75

ZWIMMÜCKEN. Delete "3 platforms" to "facilities" and substitute:

"Passenger Station.

3 platforms (2 island)—3 through tracks.

Shunt Yard (S. of station). 10 LS c. 500-747 m.

Loco. Depot. E. end of Shunt Yard.

ES, RH, holding capacity 11 locos.

Tbl (20 m.), small workshops attached.

6 DES c. 150 m. long.

6 roads through to shed, serving also coal stage, with additional Tbl (16 m.) at W. end of stage.

3 water towers, capacity 12 m.³.

Goods Yard. N. of station. Wb 35 tons, Cr 7 tons,

6 LS adjoining main line (377, 371, 264, 151, 173, and 174 m.), 1 with road access 100 m. of length, and 1 with road access for 100 m. of length."

2 storage sidings 310 and 477 m. serving SR (232 m.), with road access 232 m. 2 ER."

Page 76

LANDAU. Main Station. Delete "Wb (40 tons)" to "ES" and substitute:

"Passenger Station. 3 through roads.

Goods Station left of line. SR (333 m.), ER.

Military platform 324 m., Cr (5 tons), Cr (2 tons), Wb (40 tons).

2 LS (131 and 147 m.) with 1 DES (137 m.).

2 LS (261 and 340 m.), the latter serving goods stage and with road access 333 m. of length. 1 LS

360 m. with road access, 1 LS (718 m.) serving military platform (324 m.), 2 DES (380 and 390 m.).

Shunt Yard. Right of line.

4 stabling sidings (573, 639, 581, and 559 m.).

17 shunting sidings total length 4,240 m.

Loco. Depot. S. end of shunt yard.

ES, RH, capacity 47 locos.

Tbl (20 m.). Water tower 60 m.³ feeding at rate of 25 m.³ per hour."

GERMERSHEIM. Delete "Wb (33 tons)" to "SER" and substitute:

"Passenger Station. 4 through lines.

Right of line.

Loco. Depot.

ES (rectangular?) with 4 roads.

Tbl (20 m.).

W. tower capacity 60 m.³

Stabling Sidings.

9 LS, 757, 759, 761, 705, 714, 661, 720, 417, 276 m.

Shunting Sidings.

6 LS 352, 366, 457, 501, 2 x 250 m.

Wb (35 tons), Cr (5 tons).

Left of Line.

1 stabling siding 227 m., and 1 LS 464 m., the latter serving goods stage (SER) 200 m. long and having 140 m. of length with road access.

Tbl (16 m.). W tower 25 m.

KARLSRUHE W. Delete "Passenger station only" and substitute:

"Passenger Station. 2 platforms.

N. of station 3 LS c. 700 m.

Goods Station.

"3 LS c. 400 m. long serving shed.

2 DES c. 300 m.

2 DES c. 300 m. with connection to works N. of station.

See Plan 44."

Delete "ES (N. of station), RH, Tbl."

Page 77

WÖRTIL. Add "For details see p. 88."

KARLSRUHE Main Station. Add "For location diagram of Karlsruhe see Plan 44, and annotated air photograph Plan 44a. For details of facilities see Route 67."

Page 77

KARLSRUHE (Main Station). Delete "Restricted" to "Tbl. W" and substitute:

"Passenger Station.

9 platforms (island) c. 300 m. long.

c. 9 through tracks.

3 bay platforms c. 300 m. long, served by 6 DE tracks.

Carriage Sidings. E. of passenger station 13 LS c. 120 m.-360 m. A further group exists S.W. of station, adjoining loco. depot, comprising c. 11 LS (250 m.) and 5 LS (150 m.) serving carriage shed.

Loco. Depot. Between J triangle of Routes 66 and 75, ES rectangular c. 100 x 70 m. 12 roads, 2 Tbl (c. 25 m.). A group of c. 8 LS (150-300 m.) for coaling purposes, connected at E. end to Tbl.

Goods Station. SER. Wb (40 tons) S. of passenger station—on long platform c. 300 m. long served by 2 through tracks. 3 LS (130-220 m.) S. of platform with c. 12 short spurs off one, serving large goods stage (herring-bone design), 400 m. x 30 m., giving facilities for side and end loading. Each uncovered bay accommodates an average of 2 wagons, whilst covered bays at W. end probably accommodate more.

M. E. of passenger station. Wb (60 tons), Cr (20 tons), S. of line. Capacity 3,300 wagons per 24 hours, served by 4 tracks from W. end and 2 tracks from E. end.

Reception Sidings. 6 LS c. 800-1,000 m. each. 4 LS c. 600 m. long.

Main Marshalling Sidings. 16 LS 530-600 m. with 3 shunting necks at W. end c. 1,000 m. long.

Coaling Sidings. S. of marshalling sidings 16 LS c. 450 m. long.

Depot Sidings. N. of loco. depot in MY c. 3 LS c. 310 m. long; c. 8 LS c. 350 m.-600 m. long.

2 *Repair Shops.* N. of yard, each served by 1 LS c. 350 m. with a further group of

Departure or Reception Sidings between each shed and 675 m. long.

Loco. Depot. ES rectangular c. 100 x 30 m. with c. 4 through roads and Tbl (20 m.).

Storage Sidings for carriage and wagon shops at P. end of MY c. 12 LS 200-400 m. long.

Repair Shops.

Carriage and wagon. N.E. of passenger station and with connections from E. end of MY—equipped to deal with heavy and light repairs. Traverser.

ES RH—probably only for tank locomotives.

Total normally employed 2,800.

Locomotives (tenders only) at Durlach shops, situated S.E. of MY and with connections from E. end of yard, also connections to carriage and wagon shops.

Total normally employed c. 1,000, including staff at Offenburger shops.

Karlsruhe Main Goods Depot. Situated N. of carriage and wagon shops. SER, Wb (40 tons), Cr (20 tons), access by trailing connections from Karlsruhe-Bretten line. Holding sidings c. 6 LS (c. 250 m.) E. end of yard, and c. 6 LS (c. 250 m.) end of warehouse. 2 small yards for direct loading and unloading, 1 E. of warehouse N. of line comprises c. 4 LS (2 x 270, 2 x 320 m.), the other S. of warehouse c. 6 DES 250-350 m.

3 goods sheds, the largest measuring 250 x 25 m.

Permanent Wagon Stores Depot. Served by connections from Karlsruhe-Bretten line (Route 75) at E. end, and from loop connection to main goods station at each end. Total area c. 40,000 sq. m., c. 7 DES and 4 LS (c. 200-300 m. long) serving open storage bays.

KARLSRUHE-ALTALB. Terminus station for local electric line to HERRENALB—situated N.W. of main passenger station.

For location diagram and annotated air photographs of Karlsruhe see Plans 44-44d."

Page 78

KARLSRUHE. Delete 3 lines in details column and substitute "For facilities see p. 77."

Page 79

46.6 km.

Delete "Karlsruhe" and substitute "Route 97."

47.0 km.

Add "Route 97" after "Ludwigshafen."

Pages 80-81

DAROGAST. Delete "6 platforms" to "with road access" and substitute:

"Passenger Station. c. 9 island platforms 300 m. long, c. 12 through tracks.

Carriage Sidings. W. of station c. 3 LS c. 320 m. long.

Loco. Depot. W. of carriage sidings.

2 ES RH, total holding capacity c. 30 locos. 2 Tbl (25 m.). W. A large group of DES, average length 450 m. immediately W. of ES probably serve coal stages in addition to Engineer's Stores Depot.

Repair Shops (Loco.). S. of Loco. Depot, served by extensive group of DES—equipped to deal with heavy repairs. Total employed, together with staff at carriage and wagon shops and operating staff at Ludwigshafen c. 1,000.

Repair Shops (Carriage and Wagon). N.E. of passenger station, with connections from passenger end and also at N. end of yard.

Goods Station. E. of passenger station, with access from N. SER. Wb (50 tons), Cr (75 tons).

12 DES c. 375 m. each, 14 with road access.
2 goods sheds each c. 225 x 30 m. served by c. 6 DES c. 400 m. long.

MY. At KRAMMSTEIN (on Route 93):

Marshalling Sidings. c. 18 LS 375-500 m.

Reception or Departure Sidings. c. 9 LS 500-750 m. c. 9 LS 400-500 m.

Sorting Sidings. c. 8 LS 400 m., tranship shed c. 100 x 25 m.—S. end of yard.

9 LS c. 375 m.—N. end of yard.

Capacity of yard, c. 2,000 wagons per 24 hours.
For location diagram of Darmstadt see Plan 25."

Page 81

106-0 km.

After "Wiesbaden" add "(Route 93)."

133-9 km.

FRANKFURT. For details see Amendments for p. 36.

Page 82

KARLSRUHE. Delete first 6 lines in details column and substitute "For facilities see p. 77."

21-3 km.

BRUCHSAL. After "Heidelberg" insert "(Route 98)," after "MÜLLACKER" "(Route 70)," and after "Graben-Neudorf" "(Route 70)."

Delete "SER" to "W" and substitute "For details see p. 85."

Page 83

KARLSRUHE. Delete first 3 lines in details column and substitute "For facilities see p. 77."

5-8 km.

After "Appenweier" add "(Route 75)."

8-1 km.

After "(facing)" add "left," and after "Ettlingen" add "(Route 75)."

28-5 km.

After "Wörth" add "(Route 65)."

"J facing with ST loop line to MY, etc.," to read "Facing connection right and trailing left with MY."

29-9 km.

KARLSRUHE. Add "J facing for Routes 66 from Germersheim, 67 to Darmstadt via Graben-Neudorf, 67a to Bruchsal, 75 Kehl-Stuttgart. For details of station see p. 77."

Page 84

General details for Route 69.

10. ES. Delete "none" and substitute GERMERSHEIM, SPEYER.

9. MY. Delete "none" and substitute:
SCHIFFERSTADT (Small shunt)
GERMERSHEIM 1 yards.

0 km.

SCHIFFERSTADT. Add following details:

"Tbl (16 m.). Water tower of 16 m.³ capacity feeding at 8 m.³ per hour.

Shunt L&K. Left of line in Ludwigshafen direction.

6 LS (50 p. 47 p. 400, 225, 141, 104 m.) right of line to Neustadt 4 LS (125, 117, 113, 85, 102 m.)

1 LS (50 m.) with 14 m. length serving SK. 1 100 m. with road access."

9-1 km.

SPEYER. Delete "SER" to "V" "(6 tons)" and substitute:

"Passenger Station. 4 through tracks (3 for Ludwigshafen, 1 for Schweitzingen).

Goods Yard.

4 stabling sidings 117, 122, 83, and 89 m.—left of line.

5 stabling sidings, right of line, 370-253 m.

1 siding 370 m. long with 80 m. side loading from SR. 1 DES 82 m. to ER, 1 siding (319 m.) with 150 m. road access.

Loco. Depot.

ES for 2 locos. Tbl (13-5 m.).

W tower 22 m.³ feeding 2-5 m.³ per hour."

22-5 km.

GERMERSHEIM. Add "For details see Route 76."

Page 85

Route 70. Under MY (Route 70) insert:

"GERMERSHEIM (SY)

BRUCHSAL (SY)"

To ES add "GERMERSHEIM."

24-9 km.

BRUCHSAL. Delete "SER" to "Appendix 1" and substitute:

"Passenger Station.

3 platforms (2 island) c. 300 m. long.

3 through tracks.

Shunt Yard. W. of passenger station.

9 LS c. 400-600 m.

Goods Station. W. of and adjoining shunt yard.

SER. Wb (35 tons), Cr (6 tons).

Goods shed c. 200 x 25 m.—served by 3 LS, average c. 330 m. (1 with road access for 130 m.), 2 DES c. 400 m. long (1 with road access), 2 DES c. 250 m. (1 with road access). In between 2 groups of DES, a further group of c. 3 DES each c. 80 m.

Loco. Depot. S. of goods yard, W. of line.

ES RH (capacity c. 10 locos).

Tbl (c. 23 m.) connected to c. 4 DES (c. 260 m.) serving co. 1 stage.

W."

Page 86

23-4 km.

J, etc. . . . after "Karlsruhe" add "(Route 6-2)."

27-0 km.

J, etc. . . . after "Karlsruhe" add "(Route 23)."

30-4 km.

J, etc. . . . after "Bretten" add "(Route 73)."

41-4 km.

J, etc. . . . after "Nürnberg" add "(Route 74)."

Page 87

Route 71. Under ES insert "LANDAU, WINDEN, WÖRTH" and under MY add "LANDAU (SY), WÖRTH (SY)."

0 km.

NECKAR. Add "T. and L. 100 p. 41."

11-4 km.

LANDAU. Add "For details see p. 77."

16.7 km.

J, etc., after "Germersheim" add "(Route 75)."

Page 88

44.8 km.

WÜRTH. Add following details:

"Passenger Station. 3 through tracks.

Shunt Yard. 7 LS 613-1,272 m.—right of line.

Goods Yard. Left of line.

2 storage sidings 150 m. and 63 m. of which 38 m. of length serves SR. 1 storage siding 100 m.

Loco. Depot. Right of line.

ES capacity 2 locos.

Tbl (16 m.), W tower 32 m.², feeding 3 m.² per hour."**Page 89**

Amend heading to read "WESSENBURG-WINDEN, and so throughout the page.

Route 72. Under ES add "WESSENBURG, WINDEN" and under MY add "WESSENBURG (SY), WINDEN (SY)."

0 km.

WESSENBURG. Amend details as follows:

"Passenger Station. Terminus and former frontier station."

Goods Yard. SER, Wh, Cr.

Shunting Yard. Small group of DES, average length 500 m. S. of line with 1 LS 300 m. N. of line."

16.8 km.

WINDEN. Add following details:

"Passenger Station. 3 through tracks.

Goods Station. 1 LS 119 m. serving SER.

Shunting Yard. 7 sidings (656, 574, 491, 411, 412, 219, 138 m.). Shunting track 272 m.

Loco. Depot. ES, Tbl (20 m.), W tower 60 m.² feeding at rate of 10 m.² per hour."**Page 90**

17.1 km.

BRATTEN. After "Heilbronn" add "(Route 74)."

After "Stuttgart" add "(Route 70)."

Page 91

Add note at end of General Details, "The term 'limited traffic' used under details and facilities, is to be construed that the passenger station has limited facilities to deal with parcels traffic."

Page 92

43.7 km.

J, etc., after "Bietigheim" add "(Route 77)."

45.0 km.

HEILBRONN. After "ES" add "capacity 18-20 locos. Tbl (c. 27 m.)."

Add "RPS (points)."

Page 94

132.4 km.

J, etc., after "Gornsdorff" insert "(Route 81)."

Page 96

215.5 km.

NIESHAU. Add "For details of facilities see Route 101."

After "Regensburg" add "(Route 102)."

After (4) "Schwanau" add "(Route 103)."

After (5) "Leipzig" add "(Route 101)."

Add "(6) 1st s.o. line to Eger. (Route 102)."

Page 97

Route 75. Under MY, add "(Strasbourg)."

0 km.

Kehl, under facilities add "for diagram of connecting lines to Strasbourg see Plan 37."

8.4 km.

J, etc., after "Offenburg" add "and Basel (Route 111)."

14.2 km.

Before "ST" insert "dead-end."

26.1 km.

Before "ST" insert "dead-end."

31.0 km.

Before "ST" insert "dead-end."

Page 98

49.0

J, etc. after "Wintersdorf" add "Route 68".

53.9 km.

RASTATT. Delete "Wb" to "Kehl" and substitute:

"Passenger Station. 3 platforms (2 island) c. 250 m. long c. 6 through tracks.

Shunt Yard. E. of station.

c. 5 LS average length 750 m.

Goods Yard. E. of SY.

SER. Wb (35 tons), Cr (10 tons).

Goods shed 70-100 m. long by 20 m. wide.

Storage Sidings. 4 LS (1 with road access) average length 400 m.

Loco. Depot.

ES, Rectangular, capacity c. 4 locos.

Tbl (c. 20 m.).

W.

1 with narrow gauge line to Kehl."

Page 99

KARLSRUHE. Delete "5 main platforms" to "Appendix 3" and substitute "For facilities see p. 77."

Page 101

156.1 km.

KORNWESTHEIM. Amend details of facilities to read:

"Halt for railway personnel only.

MY—hump type—capacity 4,800 per 24 hours.

ES, rectangular, large. Tbl (27 m.). W."

166.6 km.

STUTTGART (HAUPTBAHNHOF). Add "For details of facilities see Route 82, p. 111, and Plans 39-40."

Page 103

28.4 km.

J, etc., after "Karlsruhe" add "(Route 74)."

20.2 km.

HEILBRONN. Add "I for Route 74 (Karlsruhe-Nürnberg, Route 92 to Lauda and Würzburg."

After "ES" add "capacity 13-20 locos. Tbl (c. 27 m.). RPS (points)."

Page 104

Route 78. Under ES insert "BACKNANG."

Page 105

BACKNANG. Delete "Wb" to "SER" and substitute:

"Passenger Station. 3 platforms *c.* 750 m. long, 3 platform roads *c.* 750 m. long, with additional PL 875 m., 2 LS *E.* of station *c.* 550 m.

Loco. Depot. *E.* of station, *S.* of line.

Small rectangular ES with 2 through roads, capacity *c.* 4 tank locomotives, or 2 tender locos.

Tbl (*c.* 22 m.). W.

Goods Yard. *E.* of loco. depot.

SER. Wb (40 tons), Cr (20 tons).

5 DES (*c.* 110 m.) 3 with road access."

26.3 km.

Delete "Bridge over road" and substitute "Bridge over stream and road, length *c.* 60 m."

Page 106

STUTTGART (BAD CANNSTATT). Add "For details *see* p. 111."

"J. . . . Esslingen-Ludwigsburg line." After line add "Route 76."

5.2 km.

FELLBACH. J. etc., amend to read, "J facing left with ST *s.o.* line to Backnang."

Page 107

72.2 km.

ALEN. Add under details "I with 1 m. gauge railway to Dillingen (on Route 84)—distance to Dillingen 55.3 km."

Page 108

111.3 km.

NÖRDLINGEN. Add after "ES" "J for Routes 91. to Dombühl, 89. . . . Donauworth, Günzenhausen and Pleinfeld."

Page 109

Route 80. Under ES add "LAUTERBOURG and WÖRTH," and under MY add "WÖRTH (small SY)."

0 km.

LAUTERBOURG. Add under facilities "ES. W. 1 LS (350 m.), possibly small SY *E.* of line."

Page 109

12.4 km.

WÖRTH. Add "For details *see* p. 109."

Page 110

29.7 km.

Delete "J" to "line" and substitute "J (trailing) left with DT *s.o.* line from Heilbronn and Bretten (Route 74)."

30.3 km.

CRAHLSHEIM. After "ES" add "J for DT *s.o.* line Bretten to Nürnberg (Route 74); also for ST *s.o.* line to Lauda (on Route 99)—distance to Lauda 69.1 km."

Page 111

0 km.

STUTTGART. Delete "Main Station" to "450 m." and substitute:

"Main Passenger Station. Terminus, *c.* 16 platforms *c.* 750 m.

Goods Depot. *W.* of passenger station. SER. Wb (40 tons), Cr (20 tons).

2 Goods sheds 480 x 30 m. served by 4 DES (*c.* 140 m.).

7 groups of DES: 4 DES (*c.* 300 m.), 10 DES (*c.* 270 m.), 6 DES (*c.* 550 m.), 6 DES (*c.* 250 m.), 10 DES (*c.* 200 m.), Tbl (*c.* 10 m.), SER, served by 8 DES, 3 DES (270 m.).

Goods shed (270 x 25 m.) with 3 DES alongside (*c.* 270 m.).

8 groups of 3 DES each (2 in each group with road access), average length *c.* 160 m.

Group of 8 LS (*c.* 350 m.) for storage.

Postal Station. Rectangular building 120 x 80 m. with *c.* 3 platforms for off-loading mails, served by *c.* 16 DES.

Carriage Sidings. 16 DES (*c.* 400-550 m.), 9 DES (*c.* 350-400 m.), 6 DES (*c.* 160-250 m.), 4 DES (*c.* 150-250 m.), 10 DES (*c.* 225-450 m.).

Loco. Depot. ES rectangular 125 x 125 m. served by 16 engine roads each with wet ash pits. Mechanical coaling plant (traveller type) over all roads. 2 Tbl (25 m.). W.

For air photographs (annotated) of Hbf, *see* Plans 39a and 39b.

3.4 km.

STUTTGART-BAD-CANNSTATT. Delete "SER" to "employees" and substitute:

"Passenger Station. 7 platforms (3 island) *c.* 450-600 m. long and 8 tracks.

Goods Station. SER. Wb (40 tons), Cr (30 tons).

c. 10 DES (*c.* 360 m.) serving sheds, 3 DES (*c.* 170 m.) 2 with road access, 3 DES (*c.* 230 m.) with road access, 1 DES (*c.* 50 m.) to SER, 3 DES (*c.* 300 m.), *c.* 6 DES (up to 350 m.) serving further goods shed, 4 DES (*c.* 850 m.) for storage.

Tbl (21 m.).

RPS. Passenger and goods wagons—total employed 1,103.

For annotated air photograph *see* Plan 39c."

Page 112

STUTTGART-UNTERTÜRNHEIM. Delete "MY" to "6 tracks" and substitute:

"Passenger Station. 3 platforms (2 island) 6 tracks.

Goods Station. SER. Wb (40 tons), Cr (10 tons). *c.* 8 LS (*c.* 360 m.).

Loco. Depot. *N.* end of MY.

ES. Rectangular. Tbl. W.

Repair Shops. *N.W.* of MY. *c.* 12 LS (350-400 m.).

MT. hump type, capacity 2,200 wagons per 24 hours. 12 LS (*c.* 850 m.), 6 LS (*c.* 450 m.).

For annotated air photograph *see* Plan 39d."

23.2 km.

J. etc., to Tübingen add "(Route 115)."

Page 114

37.7 km.

J. etc., to Aalen add "(Route 84)."

J. etc., to Sigmaringen add "(Route 115)."

93.7 km.

ULM { Add "For location diagram of ULM see Plan 41." Transfer MY and RPS from Neu ULM to ULM. Add "For detailed description of ULM see Route 117 and Neu ULM, Route 118."

Page 114

94.1 km.

J, etc., FRIEDRICHSTELN. Amend to read "J (facing) right with DT s.o. line to FRIEDRICHSHAFEN (Route 117)."

97.4 km.

Amend to read "J (facing) right with ST s.o. line Memmingen and Kempten (Route 118)."

Page 115

117.2 km.

Bridge over R. Günz, under details add "see Photograph 25."

Page 116

177.9 km.

AUGSBURG (Main Station). Delete "5 passenger" to "Appendix 12" and substitute:

"Passenger Station. 5 platforms (3 island) 300 m. long, 8 through roads.

Goods Depot. N. of line. SER. Wb (40 tons), Cr (15 tons).

3 separate yards, reading E.-W.

(1) 13 DES (9 with road access)—average length 300 m.

(2) 6 DES (4 with road access)—average length 100-150 m.

2 Goods sheds (100 x 40 m.) and (180 x 40 m.), the latter with c. 3 LS 180 m. long adjoining.

(3) c. 22 DES, several with road access, average length 130 m., c. 4 DES (c. 230 m.) serving 2 tranship sheds (130 x 30 m.), and (280 x 15 m.).

Carriage Sidings. N. of passenger station c. 4 LS (c. 450 m.).

MT. S. of and adjoining ...age sidings—capacity 2,300 wagons per 24 hours.

Marshalling Sidings. c. 20 LS (c. 300 m.).

Reception or Departure. 4 LS (c. 600 m.), 6 LS (200-350 m.), 10 LS (c. 300 m.).

Sorting Sidings. c. 10 LS (c. 120 m.).

S. of Yard 2 further groups 'dings:

c. 8 DES c. 300 m.

c. 10 DES c. 300 m.

Loc. Depot. E. of line to BÜCHLOZ.

2 ES RH. Holding capacity c. 30 each.

2 Tbl (23 m.). W.

Several LS serving coal stage, etc.

RWS (Carriage and Wagon). Adjoining loco depot. Total employed c. 2,600, possibly including operating personnel also."

182.7 km.

AUGSBURG-HOCHZOLL. Add note. "Although a MY is reported at HOCHZOLL, no details are available and this may possibly be one and the same as that at Augsburg main station."

Page 117

132.3 km.

Delete "J (trailing)" to "Facing (DT electric)" and substitute "J trailing right with

(1) DT ex. line from Buchse (Route 117)."

(2) 4 track electric line 50m:

(a) Herrching (ST).

(b) Gauting (4 Tr.).

(c) Thurn to Tutzing (DT), and Partenkirchen and Innsbruck (ST), Route 122."

232.9 km.

MÜNCHEN-PASSING

{ Add "See Route 122 for detailed description, and for location diagram of München, see Plan 31."

240.3 km.

MÜNCHEN (Main Station)

Page 118

General details. MY: delete "Neu."

0 km.

ULM. Add "For detailed description see Route 117 and for location diagram Plan 41."

J trailing, etc. Sigmaringen. Add "Route 116"

Page 119

72.5 km.

AALEN. Delete "Wb" to "Junction station" and substitute:

"SER. Wb (50 tons), Cr (20 tons).

ES. W.

J for DT s.o. line to Stuttgart (Route 79), ST s.o. lines to Crailsheim (Route 81) and Nördlingen (Route 79)."

Page 119

I with 1 m. gauge light railway to Dillingen (on Route 84)—distance to Dillingen 55.5 km."

40.3 km.

RAIS

{ Delete references to tramline.

47.7 km.

HAMLAR

50.5 km.

"Line curves to J" should read "Line curves N. J (trailing) left with DT electric line from Augsburg (Route 85)."

Insert "53.5 J (facing) right with DT electric line to Treuchtlingen (Route 85)."

79.4 km.

DILLINGEN. Add under facilities "I with 1 m. gauge line to Aalen (Routes 79 and 83)—distance to Aalen 55.5 km."

102.2 km.

GÜNZBURG. Add "Line proceeds W. to Stuttgart as Route 82."

Page 122

General details. Under Vulnerable Points add

(1) Electric sub-stations at Gredhart (on Route 87) and at Meitingen (54.8 km.).

34.0 km.

J trailing, etc. After "7.7.2 &" add "and Nördlingen (Route 85)."

Page 123

AUGSBURG. Add "For detailed description see p. 116 amended."

Page 124

FRANKFURT-OST. Add details of MY:

"Marshalling Sidings. 18 LS c. 150 m.

Reception Sidings. 12 LS c. 150 m.

Holding Sidings. to LSC 290 m.
 Sorting Sidings. to LSC 290 m.
 Add "For location diagram of Frankfurt see Plan 26."

Page 125

171 km.
 Flyover. After "Offenbach" insert "(Route 96)."

403 km.
 J, etc. After "Darmstadt" insert "(Route 93)."

432 km.
 ASCHAFFENBURG. Add "For location diagram see Plan 24."

437 km.
 J, etc. After WÜRTH add "Miltentburg (963 km.), Wertheim (693 km.), and Lauda (1007 km.)."

Page 126

803 km.
 J, etc. After "Weheim" add "distance from Lohr (371 km.)."

931 km.
 J, etc. Add "(Route 96)."

978 km.
 J, etc. After "Waigolshausen" add "(Route 96)."

1287 km.
 WÜRZBURG-ZELL. Add the following details:
 "MY. Capacity 2,000 wagons per 24 hours.
 ES rectangular, small. Tbl. W."

Page 127

1325 km.
 WÜRZBURG (Main Station). Delete "MY" to "ES" and substitute "3 ES, RH, holding capacity c. 70-100 locos. 3 Tbl. W. For location diagram of Würzburg see Plan 42."

1379 km.
 J, etc. Add "(Route 99)."

1518 km.
 J, etc. Add "distance to Weikersheim 363 km."

1896 km.
 J, etc. Add after Dombühl "distance 111 km." and after Neustadt "distance 290 km."

Page 128

2230 km.
 After Nürnberg add "(Route 74)."

2487 km.
 After Pleinfeld add "(Route 89)."

Page 128

251 km.
 After Nördlingen add "(Route 81)."

Page 129

General details—Traction. Delete "steam" and substitute "NÜRNBERG-FREUCHTINGEN electric. FREUCHTINGEN-MÜNCHEN steam."

0 km.
 NÜRNBERG. Delete "Wb" to "Route 74" and substitute:

"ESR. Wb, platform, CL 200 m."

MY. Capacity 1,500 wagons per 24 hours. national capacity. With water supply for up to 1 train to arrive daily from

10 Reception Roads.
 57 Marshalling Roads.
 11 Sorting Sidings.
 19 Departure Roads.
 15 Storage Roads.
 11 Sidings for private siding traffic.

Repair Shops serving MY. Locomotives and Carriage and Wagon—total employed, including staff at Augsburg, 3,700.

Loco. Depot at MY.

2 ES, RH, holding capacity c. 70-80 m.

2 Tbl. W.

Loco. Depot and Carriage Works at Rothenburgerstrasse.

2 ES, KH. 2 Tbl. W.

Capacity of sheds c. 50 locos.

Junction for lines to Hof (Route 101).

ELBA (Route 102), FÜRTH (Route 103).

REGENSBURG and Passau (Route 104).

Also Route 90 to Würzburg, and Route 74 to Bretten and Karlsruhe.

For location diagram of NÜRNBERG see Plan 34 and for further details see Route 101."

09 km.

After Bamberg add "(Route 101)."

Page 130

580 km.
 GRÖNHART. Add under facilities, "Electric transformer station." Under Vulnerable Points, p. 129, add "(d) Electric transformer station at Grönhart."

Page 131

906 km.
 J, etc. After "Neumarkt" add "distance 682 km."

1154 km.

Insert:

"Bridge over Danube c. 225 m. long river gap c. 100 m."

1176 km.

Ingolstadt. Add "For details of facilities at Ingolstadt, see Route 105."

1188 km.

After "Regensburg" add "(Route 104)," and after "Augsburg" add "(Route 89)."

Page 132

1431 km.
 J trailing, etc. (2). Add "Distance to Langenbach from Weinzach 149 km."

Page 133

1020 km.
 J, etc. After "Regensburg" add "(Route 104)."

1034 km.

J, etc. (2). After "Büchloe" add "(Route 111)."
 p. After "Paring" add "Partenkirchen and Imbabach (Route 112)."

1044 km.

J, etc. Add "(Route 111)."

1049 km.

MY. S. Add "For detailed description of facilities see Plan 34 and for further details see Route 101."

Page 134

0 km.

Augsburg. Add "For detailed description of facilities see p. 116 amended."

J facing, etc. Bielefeld. Add "(Route 120)."

5.9 km.

Augsburg-Hochzoll. See note on Amendment for p. 116.

J, etc. München. Add "(Route 82)."

Page 135

64.8 km.

J, etc. After "Regensburg-Prüfening" add "(Route 105)."

Page 136

General Details—Traction. Delete "Probably."

1.3 km.

J, etc. After "Treuchtlingen" add "(Route 85)."

Page 138

0 km.

Würzburg. Add "For location diagram see Plan 42."

9.2 km.

J, etc. After "Schweinfurt" add "(Route 100)."

18.6 km.

J (trailing) left with ST s.o. line to Schweinfurt add "distance 49.9 km." Insert kilometrage "22.4 km."

Page 139

61.3 km.

J, etc. For "Forchheim" substitute "Demant-fürth-Uhlfeld."

Add "DE Line—distance from Neustadt 15.4 km."

93.0 km.

J, etc. (2) After Bamberg insert "(Route 101)."

Page 140

97.2 km.

Amend "Bridge over railway" to read: "Railway overbridge" and details to "Line passes under ST connections from Nürnberg-Nord to Dora, and also Nürnberg-Nord to MY."

102.0 km.

Nürnberg. Add "For detailed description of facilities see Route 101, and for location diagram Plan 34."

GRADIENTS AND CURVATURE

Insert the following details regarding gradients and curves to the lines in the HOMBURG (SAAR)-LUDWIGSHAFEN Area:

Route No.	Page	Max. gradient for miles	Min. radius of curves in metres	Section
60	60	5.5 10.0	340 300	HOMBURG-HOCHSPEYER HOCHSPEYER-BAD MÜNSTER
62	65	10.0	300	SCHÖNENBERG-GLAN- MÜNCHWEILER, curves frequent
64	70	13.3	200	frequent
65	71	10.0	300	HOCHSPEYER-FRANKEN- STEIN
			400	LUDWIGSHAFEN- MANNHEIM frequent
66	74	7.6	300	WILGARTSWIESEN- REINTHAL frequent
71	87	7.6	300	MAIKAMPFER-KIRCH- WILDER-NEUSTADT frequent
72	89	5.0	Nil	WENDEN-SCHLAIDT- STEINFELD.

AMENDMENTS TO L.S.T.D. G/317

17

TABLE 1
LIST OF LOCOMOTIVE DEPOTS

R.S.D.	Place	Type of Shed	Stabling Capacity	Notes
AACHEN	AACHEN	2 RH	60	84, 85, 86, 120
	KEMPTEN	2 RH, 2 T1A (20 m.)	60	118, 120
	LANAU	"	"	117, 120
	NEU-ULM	"	"	82, 118
	MANNINGEN	1 RH, T1A (23 m.)	"	118, 119
FRANKFURT (MAIN)	AM HAFEN—WEST	"	"	86
	FRANKFURT	1 rect. ES, 2 RH, 1 other T1A	90-100	54, 53, 54, 94, 96
	HANAU	"	25-30	86, 96
KARLSRUHE	LANAU	"	"	54
	BAMM-BÜCHNER	"	"	111, 113
	BROCHAL	"	"	70, 67, 98
	GERMERSHEIM	23 rectangular	2	66, 69
	FRIBURG	"	"	111, 112
	FRIBURG GÜTTERBAHNHOF	23 rectangular	"	"
	HALTINGEN	"	"	111
	HARTACH	"	"	118
	HEIDELBERG	"	"	97, 98
	KARLSRUHE	"	"	"
	PANZERSHOF	1 ES rectangular	"	75, 66, 67, 68
	RANGIERHOF	1 ES rectangular	"	"
	KEHL	"	"	75
	KONSTANZ	"	"	112
	LAUDA	"	"	96
KARLSRUHE	MANHEIM	"	"	"
	PANZERSHOF	"	20	67, 65, 95, 97
	RANGIERHOF	"	30	"
	NICKERLE	"	"	97
KARLSRUHE	OFFENBURG	"	"	111, 112
	FORSTHEIM	"	"	75
	RASTATT	Rectangular	4	68
	RADOLFFSILL	"	"	118, 117
	SIEGEN	"	"	112, 113
	VÖLLINGEN	"	"	112
	WALDENHUT	"	"	113
	WÜRTH	ES. Tbl (16 m.)	"	66, 71
	WENDEN	Rectangular	2	71, 72
	SPEYER	Rectangular	2	69
KÖLN	KÖLN (MOSELHOF)	RH and Tbl	Medium	51, 52, 53, 54
	KÖLN (LUTTEL)	"	"	"
LUDWIGSHAFEN	FRANKENTHAL	ES. Tbl (16 m.)	2	92
	LANDAU	RH. Tbl (20 m.)	47	66, 71
	LUDWIGSHAFEN	2 RH. Tbl (25 m.)	50	65, 98
	NEUSTADT	2 RH. Tbl (20 m.)	40	71, 65
	ZWEIBÜCKEN	RH. Tbl (20 m.)	20	66
MAINZ	LAUTERFCHEN-GRUMBACH	ES. Tbl (16 m.)	"	62, 64
	ALZEV	"	"	92
	BINGERBRÜCK	RH and Tbl	20-25	54
	BISCHOFHEIM (MAINZ)	RH and Tbl	30	54
	DARMSTADT	RH and Tbl, RpS	"	67, 93, 93
	ESSENHOF	ES. Rect. Tbl (16 m.)	4	60
	LANAU	ES. Rect. Tbl (16 m.)	2	60, 64
	DARMSTADT-KRANICHSTEIN	"	"	93
	MAINZ	RH and Tbl	20-25	53, 62, 92, 93
	NIEDERLAHNSTEIN	Rect. ES and Tbl	10-15	52, 53
	OBERLAHNSTEIN	RH and Tbl	20-25	53
	WEINHAU	"	"	67
	WEISBADEN	2 RH, 2 Tbls	30-35	53, 54
	WORMS	Rect. Tbl (14 m.)	"	92
	SPEYER	Rect. Tbl (14 m.)	"	69
MÜNCHEN	FRANKENTHAL	"	"	92
	BERCHTSGADEN	"	"	109, 108
	FRILASING	"	"	124
	INGOLTAU	"	"	84, 87, 103
	MÜNCHEN PASING	4 ES (RH), 2 Tbl (25 m.)	100	82, 87, 106, 108
	MÜNCHEN (OST)	2 Tbl (20 m.)	"	108, 119, 122
	ROSENHEIM	"	"	108, 123
	SIMBACH	"	"	108
REGENSBURG	TREUCHTINGEN	"	"	85, 86, 87
	EGER	"	"	102
	LANDSHUT	"	"	106, 108
	PASSAU	"	"	104
	PLATTING	"	"	104
	REGENSBURG	"	"	101, 106, 108
REGENSBURG	SCHWANNHOF	"	"	101, 107
	WEINAU	"	"	107

AMENDMENTS TO I.S.T.D. C/317

TABLE I--(cont.)
LIST OF LOCOMOTIVE DEPOSITS--(cont.)

R.R.D.	Place	Type of Shed	Stabling Capacity	Notes
SAARBRÜCKEN	BRUNNEN	ES and Tld (11 m.)	..	66
	DELLWANG	RH and Tld	15-20	56, 57
	ERBANG	RH and Tld	27-28	51, 55
	HERMANN	..	20	77
	HAMMERS	RH and Tld	35-40	61, 62, 63
	KANSENALTERN	..	30	61, 63
	KARTHAUS	RH and Tld	25-30	51, 56
	KERN	..	20	54
	KOCHEN	..	20	51
	MERGEN	..	20	56
	NAUMHAGEN	1 rect. ES, 1 RH, Tld	45-50	57, 63
	HANGARTEN	1 RH, Tld (24 m.)	..	58
	SAARBRÜCKEN-- PARADEISEN	Rect. ES and Tld	60-80 (probably reduced to 30-40 by bomb damage)	56, 59, 60, 63
	RANGERSHOF			
	SOMMER	..	20	..
	THIER (HAUPTBf)	RH and Tld	30	51, 56
	VÖLLINGEN	Radial tracks, partly covered and Tld	20	58
STUTTGART	ALEN	..	..	79
	AULENDORF	..	..	117
	BEHLEIN	..	..	..
	CALW	..	..	..
	CRANHED	..	..	74, 81
	FREUDENSTADT	..	..	1124
	FREUDENHAFEN	..	..	117, 1174
	GRÖNINGEN	..	..	75
	HEILBRONN (HAUPTBf)	RH Tld (27 m.) rectangular	18-20	74, 77, 99
	KORNWETHEIM	..	..	75, 76
	MÖCKELER	..	..	75
	PLÖCKINGEN	..	..	82, 115
	REUTLINGEN	..	..	115
	ROTTWEIL	..	..	114
	STUTTGART-Hbf	..	..	75, 82
	STUTTGART-UNTERECKEN	..	..	75, 76
	TÜBINGEN	..	..	115
	ULM (HAUPTBf)	..	..	82, 116, 117
	ULM (RANGERSHOF)	..	..	82
NÜRNBERG	ANSBACH	..	..	74, 86
	ASCHAFFENBURG (HAUPTBf)	..	..	86, 93
	GERMUNDEN	..	..	86
	NÜRNBERG	4 RH, 4 Tld	100	71, 90, 101-4
	SCHWENFURT	..	..	100, 1004
	WÜRZBURG	3 RH, 3 Tld	70	86, 90
	WÜRZBURGER	1 ES rectangular, Tld	..	99, 100

TABLE 2
LIST OF RAILWAY WORKSHOPS

L = Locomotive Workshops PW = Passenger Coach
GW = Goods Wagons EL = Electric Locomotives
D = Diesel Locomotives ER = Electric Railcars

Place	Designation	Estimated Total Staff	Route No.
ACHAFENBURG	L and GW	—	73, 86
AUGSBURG	GW and PW	2,500	82, 120
FALEN	L and GW	600	79, 83
COSBURG (BAYERN)	GW	..	1014
DARMSTADT	*PW and L	3,000	67, 93, 93a
DURLACH (KARLSRUHE)	L (Tender only)	1,000	66, 67, 73
EMMENDINGEN (STUTTGART)	L	921	62
FRANKFURT MAIN	PW and GW	1,420	38, 33, 54
FRANKFURT NIED	L	..	38
FRIEDRICHSHAFEN	L and GW	291	117
HILDESBURG	Poles	..	74, 99
INGOLSTADT	†	1,482	84, 87, 88, 103
LUDWIGSHAFEN .. .. .	..	..	..
KARLSRUHE	L and GW	1,227	60, 64, 65
KARLSRUHE DURLACH (see DURLACH)	P and GW	..	66, 67, 73
KONSTANZ .. .. .	..	..	..
LEHR	P and GW	2,000	32
LUDWIGSHAFEN	PW	2,500	83, 92
MEININGEN	L	1,118	100a
MÜNCHEN-FRIEDMANN	L (D and E), GW	2,924	82, 87
MÜNCHEN-NEUALTHEIM	PW	3,000	106-109, 119, 132
NIED-FRANKFURT (see FRANKFURT)	..	..	..
NÜRNBERG	LP and GW	1,728	87, 95, 101-4
OFFENBURG	**L	1,000	111, 112
SAARBRÜCKEN (BIEBACH)	GW and PW	..	39, 60
ST. WENDEL	L	618	39
STUTTGART (BAD CANNITAT)	P and GW	1,103	76
STUTTGART NORTH	GW	1,000	73
SCHWETZINGEN	GW	1,000	67
STRASBOURG-BECKELM .. .. .	..	..	..
TRIER	†L	..	..
TRIER KÖNIG KATHOLIK	P and GW	2,300	31, 33
.. .. .	GW	..	33
WEIDEN (OBERFALE)	L and GW	2,200	107
INNBRUCK	EL and GW	..	121, 122

- * includes operating staff at Main Station.
- † includes operating staff at Augsburg.
- †† includes operating staff at Ludwigshafen.
- ** includes operating staff at Durlach.

AMENDMENTS TO LIST D/C/307

TABLE 3
LIST OF MARSHALLING YARDS

R.B.D.	Place	Capacity (Wagons per 24 hours)	Notes
AUGSBURG	AUGSBURG KEMPEN LINDAU-REUTEN ULM	2,300	80 120 117, 120, 121 80
FRANKFURT	HANAU FRANKFURT (MAIN) FRANKFURT (OFT)	.. 2,700 2,700	86, 96 82-4 86, 96, 96
KARLSRUHE	BASEL HEIDELBERG KARLSRUHE MANNHEIM OFFENBURG WEIL	2,400 .. 3,300 7,000 3,300 ..	111, 113 97, 98 88, 87, 75 85, 87, 95, 97 111, 112 111, 113
KÖLN	KÖLN (LUTHEL) KÖLN (MOELLER)	2,600 ..	51-4 51-4
MAINE	BINGERBRÜCK BIELEFELD DARMSTADT-KRANKENSTEIN LUDWIGSHAFEN MAINE-GUTTAVIDEN NEUSTADT OBERLAUNSTEIN WIESBADEN-BIEBRICH-OFT	2,000 3,300 2,000 2,300 2,000 ..	54 54 87, 93, 93 65, 98 54, 93 65, 71 53 53, 54
MÜNCHEN	MÜNCHEN (LAIN) MÜNCHEN (OFT) ROSENHEIM (KOLBERMOOR) INGERSBRÜCK	2,900 2,000	54 86, 123 110, 123 121-3
NÜRNBERG	ACHAFFENBURG NÜRNBERG WÜRZBURG	3,000 4,000 2,000	86, 93 74, 87, 90, 101-4 88, 90, 99, 100
REGENSBURG	REGENSBURG OBERKOTZAU	2,000 ..	104-107 101
SAARBRÜCKEN	EHRLANG HOMBURG KAMERSLAUTERN (EINWIEDLERHOV) SAARBRÜCKEN ZWEIBRÜCKEN	4,000 .. 3,500 6,000 ..	51, 55 60, 62, 63 60 59, 60 66
STUTTGART	HEILBRONN KORNWETHEIM UNTERTÜRKHEIM ULM	2,100 4,000 2,200 2,400	74, 99 75 82 82
VILLACH	VILLACH	..	123
LINA	SALZBURG	..	123

TABLE 4
LIST OF GRADIENTS AND CURVATURES

Route	Itinerary	Maximum gradient 1 in —	Minimum curvature metres
51	Apach-Trier-Kochern-Koblenz	55	350
52	Koblenz-Limburg-Frankfurt	70	250
53	Horchheim-Rüdesheim	57	300
53	Rüdesheim-Frankfurt	57	283
54	Koblenz-Bingerbrück-Mainz-Frankfurt	165	375
55	Wasserbillig-Ehrang	128	300
56	Trier-Dillingen-Völklin, en-Saarbrücken	128	300
56A	Bous-Saarbrücken	78	300
56B	Völklingen-Lehbach	80	300
57	Freistroff-Dillingen-Primweiler-(Turkishmühle) Nonweiler-Trier	60	194
57A	Wemmetweiler-Primweiler	57	290
58	Bolchen-Saarbrücken	100	380
59	Benningen-Saarbrücken - Neunkirchen - Turkishmühle - Bad Münster - Rüdesheim	50	275
60	(Saargemünd)-Homburg-Hochspeyer-Bad Münster-Gau Algeheim	100	275
61	Rohrbach-Bierbach	128	300
62	Bierbach-Bad Münster	100	293
63	Saarbrücken-Neunkirchen-Homburg	50	258
64	Kaiserslautern-Lauterecken	75	200
65	Hochspeyer-Neustadt-Mannheim-Schwetzingen	105	361
66	(Saargemünd)-Bierbach-Landau-Germersheim-Worth-Karlsruhe	33	260
67	Karlsruhe-Friedrichsfeld-Weinheim-Frankfurt	80	350
68	Wintersdorf-Karlsruhe	165	300
69	Schifferstadt-Germersheim	125	294
70	Germersheim-Bretten-Mühlacker	83	210
71	Neustadt-Winden	140	300
72	Weissenburg-Winden	140	300
73	Grötzingen-Bretten	83	450
74	Bretten-Heilbronn-Ansbach-Nürnberg	100	290
75	Kehl-Appenweiler-Karlsruhe-Bietigheim-Stuttgart	79	210
76	Kornwestheim-Emlingen	100	350
77	Bietigheim-Heilbronn	100	312
78	Bietigheim-Michelbach	100	350
79	Stuttgart-Aalen-Goldshöhe-Nördlingen	69	210
80	Berg-Worth	300	470
81	Goldshöhe-Crailsheim	138	394
82	Stuttgart-Plöchingen-Ulm-Günzburg-Augsburg-München	43	280
83	Ulm-Aalen	119	400
84	Ingolstadt-Donauwörth-Günzburg	100	200
85	Treuchtlingen-Donauwörth-Augsburg	120	510
86	(Frankfurt) - Hanau - Aschaffenburg - Gemünden - Würzburg - Ansbach-Günzenhausen-Treuchtlingen	70	300
87	Nürnberg-Treuchtlingen-Ingolstadt-München	40	292
88	Augsburg-Ingolstadt	175	722
89	Nördlingen-Günzenhausen-Pleinfeld	180	400
90	Würzburg-Nürnberg	85	300
91	Nördlingen-Dornbühl	74	400
92	Mainz-Ludwigshafen	80	350
92A	Mainz-Alzey-Monsheim	80	300
93	Mainz-Aschaffenburg	70	360
93A	Darmstadt-Eberbach	70	400
94	Langmeil-Frankfurt	110	352
95	Mannheim-Biblis	200	500
96	Frankfurt-Waigolshausen	77	190
97	Mannheim-Adelsheim	66	300
98	Bruchsal-Heidelberg	200	459
99	Heilbronn-Würzburg	66	312
100	Würzburg-Schweinfurt-Bamberg	140	330
100A	Meiningen-Schweinfurt	88	500
101	Nürnberg-Bamberg-Hochstadt-Markzeuth-Oberkotzau-Hof	40	292
101A	Meiningen-Coburg-Lichtenfels	100	300
102	Nürnberg-Schnabelwaid-Marktredwitz-Eger	80	300
103	Nürnberg-Irrenlohe-Schwandorf-Fürth	84	300
104	Nürnberg-Regensburg-Passau	97	292
105	Ingolstadt-Regensburg	100	200
106	München-Landshut-Regensburg	100	400
107	Regensburg-Schwandorf-Marktredwitz-Hof	100	400
108	München-Mühlhof-Simbach	150	400
108A	Mühlhof-Neumarkt-St. Veit-Landshut	74	400

TABLE 4--(cont.)
LIST OF GRADIENTS AND CURVATURES--(cont.)

Route	Riveway	Maximum gradient 1 in --	Minimum curvature metres
108a	Mühldorf-Freilassing	90	450
109	Rosenheim-Mühldorf	175	300
110	(Basel)-Weil-Lorrach-Säckingen	98	270
111	Basel-Müllheim-Freiburg-Offenburg-Appenweier	165	300
111A	Frontier-Breisach-Freiburg	84	600
111B	Freiburg-Donauschillingen	18	225
111C	Hinterzarten-Seebrugg	50	225
111D	Müllheim-Müllhausen	200	450
112	Offenburg-Hausach-Donauschillingen-Immendingen-Singen-Konstanz	50	300
112A	Hausach-Freudenstadt	20	185
113	Basel-Säckingen-Singen	62	300
113A	Oberlauchringen-Hintschingen	62	300
114	Tuttlingen-Horb-Stuttgart	50	300
115	Horb-Plöchingen	96	345
116	Tuttlingen-Sigmaringen-Ulm	140	286
117	Radolfzell-Friedrichshafen-Aulendorf-Ulm	100	299
117A	Friedrichshafen-Lindau	125	300
118	Kempten-Memmingen-Neu Ulm	140	300
119	Memmingen-Böchlö-München	80	292
120	Lindau-Kempten-Böchlö	80	292
120	Böchlö-Augsburg	120	510
122	Frontier-Murnau-München	60	200
123	Frontier-Rosenheim-München	81	250
124	Rosenheim-Freilassing-(Salzburg)	25	100

TABLE 3
LIST OF LINE CAPACITIES

Route	Itinerary	No. of trains per day each way	Net load per train military stores (tons)
51	Apach-Trier-Koblenz	72	400-475
52	Koblenz-Limburg-Frankfurt	72	310-375
53	Koblenz-Rüdesheim-Frankfurt	72	575
54	Koblenz-Bingerbrück-Frankfurt	72	575
55	Wasserbillig-Trier W.-Ehrang	72	575
56	Trier-Dillingen-Saarbrücken	72	400-475
56a	Bous-Wehrden-Saarbrücken (short 1 km. S.T. section Bous will not materially reduce practicable capacity)	46	400-475
56b	Völklingen-Lebach	24	300-350
57	Freistroff-Dillingen (Turkismühle) (throughout capacity as limited by single track section)	20	500
57a	Wernsmutweiler-Lebach-Primsweiler	20	500
58	Hargarten-Völklingen (based on assumption that track is Double—capacity will be less if track is Single)	60	400-500
59	Berlingen-Saarbrücken-Bad Münster (Bingerbrück) (Rüdesheim)	60	400-500
60	Saargemünd-Saarbrücken-Kaiserslautern-Bad Münster-Frankfurt	60	400-450
61	Rohrbach-Bierbach-Zweibrücken (throughout capacity)	20	300-400
62	Bierbach-Homburg-Bad Münster	60	400
63	Saarbrücken-Schifflweiler-Neunkirchen-Homburg	72	500
64	Kaiserslautern-Lauterbach-Grombach	24	300-350
65	Kaiserslautern-Mannheim	72	450-500
66	Saargemünd-Zweibrücken-Karlsruhe	60	400-450
67	Karlsruhe-Graben-Neudorf-Mannheim-Darmstadt-Frankfurt	72	500
67a	Karlsruhe-Bruchsal	72	500
68	Winterdorf-Rastatt-Karlsruhe	72	500
69	Schifferstadt-Germersheim	60	500
70	Germersheim-Bruchsal-Möhlacher	60	400
71	Neustadt-Winden	60	400-450
72	Winden-Worth	20	400-450
73	Weisenburg-Winden	72	400-450
74	Grötzingen-Bretten	20	300-400
75	Bretten-Heilbronn-Ansbach-Nürnberg	60	400
76	Kehl-Appenweiler-Karlsruhe	72	400-450
77	Karlsruhe-Stuttgart	60	400-450
78	Ludwigsburg-Stuttgart (Untertürkheim)	30	500
79	Bietigheim-Heilbronn	60	450-500
80	Bietigheim-Bachmann-Schwab-Hall-Hemmental	20	330-350
81	Stuttgart-Goldhof	60	400-450
82	Goldhof-Nördlingen	24	400-450
83	Lauterbourg-Worth	60	400-450
84	Goldhof-Craillheim	24	400
85	Stuttgart-München (throughout capacity)	72	300-350
86	Ulm-Aalen	20	300-400
87	Ingolstadt-Günzburg (throughout capacity)	18	300-400
88	Treuchtlingen-Augsburg	72	400
89	Frankfurt-Hanau-Würzburg-Ansbach	60	400
90	Nürnberg-Treuchtlingen-München	60	400
91	Augsburg-Ingolstadt (throughout capacity)	20	300-400
92	Donauwörth-Nördlingen-Günzenhausen-Pleinfeld (throughout capacity)	16	300-400
93	Würzburg-Nürnberg	60	400-500
94	Nördlingen-Dombühl	20	300
95	Mainz-Worms-Ludwigshafen	72	500
96	Mainz-Alzey-Monsheim (throughout capacity)	16	400
97	Mainz-Darmstadt-Aachenburg	72	500
98	Darmstadt N.-Eberbach	12-16	500
99	Lambsheim-Worms-Frankfurt	72	500
100	Mannheim-Biblis	72	500
101	Frankfurt-L. 107 km.	72	500
102	Frankfurt-L. 107 km.	16	500
103	Mannheim-Heidelberg-Neckargemünd-Osterburken	60-72	500
104	Neckargemünd-Jagstfeld (throughout capacity)	16	500
105	Frankfurt-Heidelberg	72	500
106	Heidelberg-Landau-Wormburg	100-72	500
107	Wormburg-Schweinfurt-Bamberg	72	500
108	Münster-Hannover-Schleswig-Holstein	72	500
109	Nürnberg-Hannover	72	500
110	Frankfurt-Mannheim	72	500

TABLE 3—(contd.)
LIST OF LINE CAPACITIES—(contd.)

Route	Itinerary	No. of trains per day each way	Net load per train military stores (tons)
101A	Meiningen-Coburg-Lichtenfels (throughout capacity)	16	300
102	Nürnberg-Markredwitz	48	300-400
	Markredwitz-Eger	12	300-400
102A	Schnebelwaid-Bayreuth-Neuenmarkt	12	300-400
103	Nürnberg-Amberg	48	300-400
	Amberg-Fürth (throughout capacity)	12	300-400
104	Nürnberg-Regensburg-Passau (throughout capacity)	60	300
105	Ingolstadt-Regensburg (throughout capacity)	16	400
106	München-Landshut-Regensburg (with electric traction)	96	500
	(with steam traction)	72	500
107	Regensburg-Schwandorf-Irrenlohe-Weiden-Wiesau-Markredwitz-Hof	60	300
	(throughout capacity)	12-16	400
108	München-Simbach (throughout capacity)	12	300
108A	Mühldorf-Landshut	12	300
108B	Mühldorf-Freilassing	12	300
109	Rosenheim-Mühldorf	12-16	400
110	Basel-Schopfheim-Säckingen (with electric traction)	24	400
	(with steam traction)	12-16	350
111	Basel-Offenburg-Appenweier	72	500
111A	Colmar-Freiburg	12	350
111B	Freiburg-Donauschillingen (throughout capacity with electric traction) (Line could not be effectively worked by steam traction unless rack section is re-introduced)	12	100
111C	Titisee-Seeburg (with electric traction)	12	250
	(with steam traction)	8-10	200
111D	Müllheim-Müllheim	12	400
112	Offenburg-Villingen	48	200
	Villingen-Immendingen	12-16	200
	Immendingen-Konstanz	48	200
112A	Waldshut-Konstanz (with special 0-10-0 locos.)	8-10	80
113	Basel-Waldshut-Singen (throughout capacity)	12-16	250
113A	Oberachringen-Hintzingen	12-16	250
114	Immendingen-Portweil-Stuttgart (assumed that line is now D.T. throughout)	48	200
115	Horb-Tübingen	12-16	350
	Tübingen-Möchingen (with electric traction)	60	500
	(with steam traction)	48	350
	Throughout capacity	12-16	350
116	Tutlingen-Sigmaringen-Schelklingen-Ulm (throughout capacity)	12-16	350
117	Radolfzell-Friedrichshafen (throughout capacity)	12-16	350
	Friedrichshafen-Ulm	48	400
117A	Friedrichshafen-Lindau	12-16	350
118	Kempten-Memmingen-Neu Ulm	12-16	350
119	Memmingen-Bühlloe	12	300
	Bühlloe-München	48	300
120	Lindau-Kempten-Augsburg (steam traction)	48	300-400
121	Lindau-Bregenz-Innsbruck		
	With electric traction (throughout capacity)	12-16	300
	With steam traction (throughout capacity)	10-12	250
122	Innsbruck-Partenkirchen-München		
	With electric traction (throughout capacity)	12-16	300-400
	With steam traction (throughout capacity)	10-12	300
123	Kufstein-Rosenheim-München (with electric traction)	60-72	400-500
	(with steam traction)	48	400
123A	Brenner-Innsbruck-Kufstein (with electric traction)	72	500
	(with steam traction)		
	Brenner-Innsbruck	48	250-300
	Innsbruck-Kufstein	72	500
124	Wörgl-Salzburg-Rosenheim (with electric traction)	48	400
	(with steam traction)	36	300
125	Jesenice-Rosenbach	48	200
	Rosenbach-Villach	16	200
	Turvisco-Villach	16	200
	Villach-Spital Millstättersee	48	350
	Spital Millstättersee-Schwarzach St. Veit		
	With electric traction (throughout capacity)	24	350
	With steam traction (throughout capacity)	12-16	200
126	S. Carol. L. Immenhof-Spital Millstättersee	16	200-250

ROUTE 98 MAINZ-WORMS-LUDWIGSHAFEN

General Description

Connecting at Mainz with Routes 53 and 54, and at Ludwigshafen with Routes 63 and 69, this line normally provides the most important route for trains from the N (Ruhr) Area to Karlsruhe and the S. Owing, however, to the destruction caused by bombing, traffic between the Ruhr and the area S of Karlsruhe is reported to have been diverted via Winden-Neustadt-Kaiserslautern. Other important junctions are at Mainz with lines E to Frankfurt and Darmstadt (Routes 54 and 93), at Worms with Route 94 from Langmeil, Kaiserslautern, and the Saar to Darmstadt, Frankfurt, and the NE, whilst at Ludwigshafen, Routes 63 and 99 provide the main W to E cross country route (Saar region to Würzburg, Nürnberg and Schweinfurt).

The line follows the left bank of the Rhine and gradients will not be severe.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 67.3 km. (41½ miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 12½ per mille (1 in 80).
6. MINIMUM RADIUS OF CURVES: 350 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS: 8.3 km. (5 miles).

9. ENGINE SHEDS:

Mainz Hbf. Ludwigshafen.
Worms. Frankenthal.

10. MARSHALLING FACILITIES:

Mainz Bischofsheim. Ludwigshafen.

11. WATERING FACILITIES:

Mainz Hbf. Worms.
Ludwigshafen (Rhein).

12. VULNERABLE POINTS: Marked with asterisk in text.

- (a) Locomotive and marshalling facilities at Ludwigshafen, Worms and Mainz.
- (b) Tunnel at 0.9 km.
- (c) Junctions at Mainz, Worms and Ludwigshafen.

13. CAPACITY:

Trains per day each way	Net train load tons military stores
72	500

Distances from Mainz

Km.	Stations	Engineering works	Details and facilities
6.1	WIEBRADEN	..	Routes 53 and 54.
0	MAINZ Hbf	..	SER. Wb (60 t). Cr (10 t). ES (20-25) RH. Tbl W. MY at Mainz Bischofsheim (capacity 3,000 wagons per 24 hours). See Route 54.
0.9	..	Tunnel.	1,193 m. long—curve in tunnel c. 1,000 m. radius.
1.8	MAINZ SUD	..	Passenger Station.
2.1	..	..	J (facing) right with DT s.o. line to Bischofsheim and Frankfurt (Route 54), also Darmstadt (Route 93).
2.8	..	Railway overbridge.	Line passes under Route 54 to Frankfurt. Line proceeds along left bank of Rhine.
3.8	MAINZ-WESENHAU	..	Restricted goods facilities.
5.0	..	..	Line turns SW away from Rhine.
5.3	MAINZ-WESENHAU Gbf	..	SER. Wb (40 t). Cr (3 t). Goods station only.
6.8	LAURENHEIM	..	Restricted goods facilities.
8.3	..	..	Line crosses stream.
9.9	..	..	Line turns SE.
10.3	BISCHOFHEIM	..	Wb (40 t). Cr (3 t). SER.
11.0	..	..	J (facing) right with SF s.o. branch line to Underheim and Alzey. Line turns E to rejoin bank of Rhine when it turns S.
11.7	NECKENHEIM	..	Cr (20 t). SER.
11.9	..	..	Line crosses into Rhine.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
18.4	NIEDERTRIM	..	Wb (33 t). SER. Cr (3 t). J (facing) right with ST branch line to Udenheim.
18.8	..	..	Line crosses minor road.
19.4	..	..	Line crosses minor road.
20.4	OFFENHEIM	..	Wb (34 t). SER. Cr (3 t). Line turns S away from river.
21.4	..	Bridge over stream.	
22.7	..	Ditto	
26.8	..	Bridge over stream and road.	
27.3	..	..	Line crosses road.
27.6	..	..	Line crosses road.
27.8	GUNTERSBLOM	..	Wb (34 t). SER. Cr (2 t). J (facing) left ST s.o. with branch line to Rheindürkheim and Osthofen.
28.3	..	Bridge over stream.	
30.0	..	..	Line crosses road.
30.8	ALSHEIM	..	Wb (34 t). Cr (2 t). SER.
31.7	..	Bridge over stream.	
33.7	MEITENHEIM	..	Cr (1.3 t). SER. Line crosses road.
35.4	..	Bridge over road.	
37.3	..	..	J (trailing) right, with ST s.o. line from Gau Odernheim.
37.5	..	..	J (trailing) right, with ST s.o. DE branch line from Westhofen, c. 5 km. long.
37.6	OSTROFEN	..	Wb (40 t). Cr (2 t). SER.
37.8	..	..	Line crosses main road.
38.1	..	..	J (facing) left, with ST s.o. branch line to Rheindürkheim and Gun- tersblum.
39.2	..	Bridge over river.	
39.5	..	Bridge over R. Grails-Pach.	
40.8	..	..	Line crosses road.
44.6	..	Bridge over stream.	
45.0	..	..	J (trailing) right, with ST s.o. DE branch line from Gundheim.
*45.1	..	..	J (facing) left, with DT s.o. line to Frankfurt (Route 94).
*45.8	WORMS	..	ES. Tbl. W. Wb (40 t). SER. Cr (10 t). Line crosses several roads in town.
*46.7	..	Road overbridge.	J (facing) right, with DT s.o. line to Mannheim and Kaiserslautern (Route 94).
46.9	WORMS-VORSTADT	Bridge over road.	Passenger halt.
47.3	..	Bridge over road.	J (facing) right, with ST s.o. branch line to Grünstadt. Line runs parallel with arterial road to Ludwigshafen.
50.0	..	Bridge over stream (Leinit- ger).	
50.6	..	Bridge over road.	
51.0	ROSENHEIM	..	SER. Wb (35 t). Line crosses road.
51.6	..	..	Ditto
52.3	..	..
56.4	..	Bridge over road and canal line from Gross Karl- bach.	
56.8	FRANKENHOFEN	..	Small ES (rectangular) 2 by 4 2 1/2 ft (12 and 18 in. W. (12 ft 6 in.) 100 ft long bridge 12 ft 6 in. high 12 ft 6 in. high SER. Wb (35 t). Cr (10 t). Line crosses road.

Km.	Stations	Engineering works	Details and facilities
56.9	..	Bridge over road.	
57.5	..	Ditto	
58.2	J (facing) right, with ST s.o. line to Freinschein.
58.7	..	Bridge over stream.	
59.1	Line crosses main road and turns SE to Ludwigshafen.
59.9	..	Bridge over road, Worms-Ludwigshafen.	
60.8	Line crosses road.
61.7	J (trailing) left, with DT works line from Edigheim and riverside industrial establishments. See Plan No. 31.
62.7	LUDWIGSHAFEN- OOGERSHEIM	..	SER. Wb (40 t). Cr (30 t). Line diverges into 4-track, one DT to MY, one DT main line to main passenger station. Line crosses road. Line crosses road. Line passes under DT line to MY. J (trailing) left, with private siding to gasworks. J (facing) right, with line to Loco depot and RPS. Line continues 4-track. J (trailing) right, with (i) DT main line to Mannheim (Route 65). (ii) from Karlsruhe (Route 65). (iii) DT main line from Neustadt (Route 65). Line continues c. 10 tracks. J (facing) left, to goods station, and industrial sidings.
63.4	..	Level crossing.	
63.4	..	Fly-over.	
65.3	
67.1	..	Road overbridge	
67.5	LUDWIGSHAFEN (RHEN)	..	Terminal Passenger Station: 5 platforms. Tbl (23 m.) W. Goods Station: SER. Wb (60 t). Cr (10 t). c. 5 DES (270 m. each). Goods shed 180 x 21 m., c. 5 LS (270 m.) E of shed converging to wagon Tbl at N end. Shunt Yard (E of goods yard), c. 5 LS (c. 360 m.) adjoining line to industrial sidings. Carriage Sidings: E of shunt yard 5 LS (c. 360 m.); also group of sidings E of carriage sidings extending, at least DT, along left bank of river, for c. 6 km., serving riverside establishments. Industrial Sidings: W-E. c. 10 LS (c. 600-900 m.). c. 12 LS (c. 150 m.). c. 5 LS (360 m.). c. 5 LS (340-800 m.). c. 12 LS (240-360 m.). with connections to industrial establishments and riverside sidings. RPS—Passenger Rolling Stock: SE of passenger station, served by several sidings. Tbl (c. 25 m.) at S end. Marshalling Yard: S of RPS (capacity 2,000 wagons per 24 hours). c. 25 to LS (c. 150 m.) for marshalling. c. 10 to LS (c. 150 m.) for reception. c. 10 to LS (c. 150 m.) for departure.

Km.	Stations	Engineering works	Details and facilities
			<i>Locomotive Depot: 4 of MY. 2 ES (RH) each 25-30 roads. 2 Tbls (c. 25 m.) W. Several LS (?) serving coaling plant on E side; also several DES on W side of sheds. For location diagram of Ludwig- shafen, see Plan No. 31.</i>

ROUTE 92A MAINZ HBF-ALZEY-MONSHEIM

General Description

Although ST, except where it runs in common with the Bingerbrück-Mannheim line, this line has proved important as an alternative route for traffic from Mainz, Worms and Neustadt, upon the dislocation of the main lines as a result of air attacks.

Gradients have a general tendency to rise rather steeply between Mainz and Alzey, and fall from Alzey to Monsheim.

Principal junctions are at Mainz for the main lines to Koblenz, Wiesbaden and Frankfurt (*Route 54*)—at Armsheim and Alzey for the ST line Mannheim to Bingerbrück and at Monsheim with the main line Kaiserlautern to Worms, Darmstadt and Frankfurt (*Route 94*).

Engineering works are not considerable although several minor rivers and streams are crossed en route.

General Details

- GAUGE: 1,435 mm. (4 ft. 8½ in). Standard.
- LENGTH: 59.7 km. (37 miles).
- TRACK:
 - Mainz-Armsheim, single.
 - Armsheim-Alzey, double.
 - Alzey-Monsheim, single.
- MAXIMUM PERMISSIBLE AXLE LOAD:
 - Mainz-Armsheim, 20 metric tons.
 - Armsheim-Alzey, 16 metric tons.
 - Alzey-Monsheim, 17 metric tons.

- MAXIMUM GRADIENT: 12½ per mille (1 in 80).
- MINIMUM RADIUS OF CURVES: 300 m.
- TRACTION: Steam.
- MAXIMUM DISTANCE BETWEEN STATIONS:
 - 6 km. (3½ miles).
 - Wörstadt, 27.5 km.—Armsheim, 33.5 km.
- ENGINE SHEDS:
 - Mainz.
 - Bischofsheim.
 - Alzey.
- MARSHALLING FACILITIES:
 - Mainz.
 - Bischofsheim.
- WATERING FACILITIES:
 - Mainz.
 - Bischofsheim.
 - Alzey.
- VULNERABLE POINTS: Marked with asterisk in text.
 - (a) Locomotive and marshalling facilities at Mainz and Alzey.
 - (b) Junctions at Mainz, Armsheim, Alzey and Monsheim.
 - (c) Bridges—see description of line.
 - (d) Tunnel at 12.0.
- CAPACITY:

Trains per day each way	Net train load tons military stores
16	400

Distance from Mainz:

Km.	Stations	Engineering works	Details and facilities
0	MAINZ HBF	..	SER. Wb (60 t). Cr (10 t). ES (20-25) RH. Tbl W. MY (Mainz, Bischofsheim). J (facing) right with quay siding.
1.8	..	..	Passenger halt. Line leaves the Rhein valley and runs in general southerly direction to Nieder Olm.
2.3	WAGGON FABRIK	..	J (facing) right with DT s.o. line to Wiesbaden and DT s.o. line to Koblenz (S bank). Line curves sharply left.
3.2	..	Bridge or culvert over stream (Gonsl.)	
3.5	..	Ditto	Line crosses road.
5.6	MAINZ GONSENHEIM	..	SER. Wb (60 t). Line curves sharply left and crosses secondary road.

Km.	Stations	Engineering works	Details and facilities
6.9	Line crosses main road W.
9.6	Ditto
10.2	MAHRENBORN (HLM)	..	SR.
11.0	..	Road overbridge.	Line crosses minor road.
12.0	..	Road overbridge.	Carrying main road to Alzey.
13.0	..	Tunnel.	Line curves right.
13.7	KLEIN WENTERSHEIM OBER OLM	..	Carrying minor road.
14.3	..	Road overbridge.	c. 400 m. long.
16.2	..	Bridge or culvert over stream.	Line crosses main road to Alzey.
16.3	SER. Cr (2 t).
17.2	..	Road overbridge.	Line curves left.
17.5	..	Ditto	Line crosses minor road.
17.8	NIEDER OLM	..	Carrying minor road.
18.3	..	Road overbridge.	Line crosses main road.
18.7	..	Bridge over R. Selz.	Carrying secondary road.
19.2	..	Bridge or culvert over stream (Mühl).	Carrying minor road.
19.3	SER. Wb (40 t). Cr (2 t).
22.1	..	Bridge over main road.	Line runs SW to Armsheim.
22.5	NIEDER SAULHEIM	..	Carrying main road.
23.7	..	Bridge over minor road.	SER. Wb (40 t). Cr (2 t).
27.5	WÖRSTADT	..	Line crosses main road.
27.7	..	Road overbridge.	SER. Wb (40 t). Cr (2 t).
30.4	..	Bridge or culvert over stream.	Carrying main road.
32.6	Line crosses main road.
32.9	..	Ditto	J (trailing) right with ST s.o. line from Bingerbrück.
33.5	ARMSHEIM	..	Line runs DT to Alzey.
34.4	..	Ditto	Line crosses minor road.
34.6	SER. Wb (31 t). Cr (2 t).
37.6	..	Road overbridge.	J (facing) right ST s.o. dead end line to Wendelsheim (8 km.).
38.7	ALBIO	..	Line crosses main road.
39.3	..	Bridge or culvert over stream.	Carrying main road to Alzey.
41.2	ALZEY	..	Line crosses minor road.
41.6	..	Bridge or culvert over stream (Selz).	Line crosses minor road.
41.8	SER. Wb (30 t). Cr (2 t).
42.5	J (trailing) left with ST s.o. line from Gau Odernheim.
43.0	Line crosses main road.
43.1	Wb (40 t). Cr (10 t).
43.2	ES. Thl. W.
43.3	Line runs SE to Gundersheim.
43.4	Line crosses minor road.
43.5	Line crosses main road.
43.6	Ditto
43.7	J (facing) right with DT s.o. line to Mainz.
43.8	Line runs ST to Mainz.
43.9	Line crosses main road to Monsheim.
44.0
44.1
44.2
44.3
44.4
44.5
44.6
44.7
44.8
44.9
45.0
45.1
45.2
45.3
45.4
45.5
45.6
45.7
45.8
45.9
46.0
46.1
46.2
46.3
46.4
46.5
46.6
46.7
46.8
46.9
47.0
47.1
47.2
47.3
47.4
47.5
47.6
47.7
47.8
47.9
48.0
48.1
48.2
48.3
48.4
48.5
48.6
48.7
48.8
48.9
49.0
49.1
49.2
49.3
49.4
49.5
49.6
49.7
49.8
49.9
50.0

Km.	Stations	Engineering works	Details and facilities
48.8	EPFELSHHEIM (RHEINHEIM)	..	ER. Wb (40 t). Cr (2 t). Line crosses main road at station. Line crosses minor road.
49.2	..	Bridge or culvert over stream.	
49.7	..	Road overbridge.	Carrying main road.
50.1	..	Bridge or culvert over stream (Wasch).	
			Line crosses minor road.
51.6	GUNDERSHEIM	..	Wb (30 t). Cr (2 t). Line crosses minor road at station. Line curves right and runs SSW until c. 2 km. from Monsheim when it turns SE. Line crosses 2 minor roads.
56.4	NIEDER FLORESHEIM-DALSHEIM	..	SER. Wb (32 t). Cr (3 t). Line crosses main road. Carrying secondary road.
57.3	..	Road overbridge.	
58.2	..	Bridge or culvert over stream (Pfimm).	
58.5	..	..	J (trailing) right with ST s.o. line from Marnheim (Route 94).
58.7	..	Bridge over main road.	
	..	..	J (facing) right ST s.o. line to Grünstadt.
59.7	MONSHEIM	..	SER. Wb (34 t). Cr (3 t).

ROUTE 93

MAINZ-GROSS GERAU-DARMSTADT-ASCHAFFENBURG

General Description

Connecting with Route 54 at Mainz and with Route 86 at Aschaffenburg, this line provides, together with those routes, the main through service from Köln and the Ruhr area to the SE and Austria via Würzburg, Nürnberg and München.

The most important junctions en route are at Gross Gerau and Darmstadt with Routes 93 and 67 respectively, giving main line connections from the Saar, Karlsruhe and the S.

Gradients, which will not be severe, have a tendency to rise for the first 43.0 km., and thence gradually fall towards Aschaffenburg.

The most important bridges occur at 3.1 km., where the line crosses the Rhine, and at 66.5 km. over the R. Main, but in addition numerous bridges over tributaries are encountered in crossing the valleys of both rivers.

General Details

1. GAUGE: 1,433 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 72.3 km. (45 miles).
3. TRACK: Double
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 14 per mille (1 in 70).
6. MINIMUM RADIUS OF CURVES: 360 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 8.2 km. (5 miles).

9. ENGINE SHEDS:

Mainz.
Mainz Bischofsheim.
Wiesbaden.
Darmstadt Hbf.
Darmstadt Kranichstein.
Aschaffenburg Hbf.
Aschaffenburg W.

10. MARSHALLING FACILITIES:

Mainz Bischofsheim.
Darmstadt-Kranichstein.
Aschaffenburg.

11. WATERING FACILITIES:

Mainz.
Darmstadt-Kranichstein.
Aschaffenburg Hbf.
Aschaffenburg W.

12. VULNERABLE POINTS: Marked with asterisk in text.

- (a) Marshalling and locomotive facilities referred to in 10 and 11 above.
- (b) Junctions at 2.1 km., 20.0 km., 29.6 km., 33.9 km., 65.2 km.
- (c) Tunnel at 0.9 km. (1,193 m. long).
- (d) Bridge at 3.1 km.

13. CAPACITY:

Trains per hr. Nightly freight
each way trains

MAINZ TO ASCHAFFENBURG

31

Distance from Mainz

Km.	Stations	Engineering works	Details and facilities
9.7	WIESBADEN	..	Route 54.
10.0	MAINZ	..	SER. Wb (60 t). Cr (10 t). ES (20 t). Rsl. Tbl. W.
10.9	..	Tunnel.	c. 1,193 m. long, curve in tunnel c. 1,000 m. radius. Line runs SE.
11.8	MAINZ SUD	..	Passenger station.
12.1	...	..	J (facing) left, with DT s.o. line to Worms (Route 92). Line curves E.
12.8	..	Bridge over railway.	Total length 1,029 m.
13.1	..	Bridge over R. Rhine.	4 arches, each c. 105 m. span, with approach spans on both banks. For sketch, see App. 20.
14.5	MAINZ-GUTTENBURG	..	SER. Wb (40 t). Cr (5 t).
16.6	..	Railway overbridge.	Line passes under DT connection from Wiesbaden.
17.5	..	..	J (trailing) right, with DT line from Wiesbaden.
18.1	MAINZ-BISCHOFHEIM	..	SER. Wb (40 t). MY, capacity 3,200 wagons per 24 hours.
19.6	..	..	Loco Depot: ES RH (50). Tbl. J (facing) left, with DT s.o. line to Frankfurt (Route 54). Line runs SE to Darmstadt.
19.1	..	Bridge or culvert over stream.	
19.5	..	Road overbridge.	
19.7	..	(?) bridge.	Line crosses road.
19.7	..	Bridge over stream.	
19.7	..	Road overbridge.	
19.4	NAUHEIM	..	SER. Wb (40 t). Cr (3 t). Line crosses road.
19.4	..	Bridge over stream.	
18.0	..	Ditto	
18.1	..	Ditto	
19.5	..	..	Line crosses main road.
19.5	GRUSS GERAU	..	SER. Wb (60 t). Cr (10 t).
20.0	..	..	J (facing) right, with DT s.o. line to Worms (Route 94).
20.3	..	Bridge over river (Muhl- bach).	
20.6	..	Bridge over railway.	Line passes over DT line, Worms- Frankfurt (Route 94).
21.6	..	Bridge or culvert over stream.	
22.0	KLEIN GERAU	..	Passenger station with restricted goods facilities.
22.1	..	..	Line crosses road.
22.2	..	Ditto	
22.3	..	Ditto	
22.4	..	Ditto	
22.5	..	Ditto	
22.6	..	Ditto	
22.7	..	Ditto	
22.8	..	Ditto	
22.9	..	Bridge over road.	
23.0	WIESBADEN	..	SER. Wb (40 t).
23.1	..	..	Line crosses main road.
23.2	..	..	Ditto
23.3	..	..	Line crosses main road.
23.4	..	..	Line crosses main road.

Km.	Stations	Engineering works	Details and facilities
29.8 *29.9	STRAßKIRCHEN	..	Pa. <i>anger station.</i> J (la. <i>ng</i>) right, with DT s.o. line to <i>imstadt main station</i> (distance <i>km.</i>). J <i>Hy-aver</i> <i>st</i> , with line Darmstadt Hbf-Ma. <i>st</i> . J (trailing) <i>st</i> , with DT s.o. line from <i>Gohl</i> <i>au Esfelden</i> (J for Route 94, W. <i>in Frankfurt</i>). J (facing) right <i>th</i> loop line to main station.
*30.6	..	..
*33.9	DARMSTADT Hbf	..	<p><i>Passenger Station:</i> <i>c.</i> <i>island</i> platforms 300 m. long. <i>c.</i> 12 through tracks.</p> <p><i>Carriage Sidings:</i> W of station. <i>c.</i> 8 LS <i>c.</i> 520 m. long.</p> <p><i>Loco Depot:</i> W of carriage sid. <i>q.</i> 2 ES (RH); holding capacity, <i>c.</i> 50 locos. 2 Tbl (25 m.). W.</p> <p>A large group of DES, average length 450 m., immediately W of ES, probably serves coal stages in addition to engineer's stores depot.</p> <p><i>Repair Shops (Loco):</i> S of loco depot, served by extensive group of DES, equipped to deal with heavy repairs. Total employed, together with staff at C. and W. shops and operating staff at Ludwigshafen, <i>c.</i> 3,000.</p> <p><i>Repair Shops (Carriage and Wagon):</i> NE of passenger station, with connections from goods yard and <i>sk</i>, at N end, from Route 93.</p> <p><i>Goods Station:</i> E of passenger station, with access from N. SER. Wb (60 t). Cr (7.5 t). 12 DES <i>c.</i> 375 m. each, 10 with road access. 2 goods sheds, each <i>c.</i> 225 x 30 m., served by <i>c.</i> 6 DES, <i>c.</i> 400 m. long.</p> <p><i>Marshalling Yard,</i> at Kranichstein (on Route 93). <i>Marshalling Sidings,</i> <i>c.</i> 18 LS, 375-600 m.</p> <p><i>Reception or Departure Sidings,</i> <i>c.</i> 9 LS 500-750 m. <i>c.</i> 9 LS 400-500 m.</p> <p><i>Sorting Sidings,</i> <i>c.</i> 8 LS, 400 m.</p> <p><i>Tranship Shed,</i> <i>c.</i> 100 x 25 m.; S end of yard.</p> <p>9 LS, <i>c.</i> 375 m.; N End of yard. Capacity of yard, <i>c.</i> 2,000 wagons per 24 hours.</p> <p>For location diagram of Darmstadt, see Plan 25.</p>
30.9	..	Railway overbridge.	Line passes under DT main line Karlsruhe-Frankfurt (Route 67).
31.2	..	Railway overbridge.	Line passes under DT line Frankfurt-Karlsruhe (Route 67), also fly-over connection from Darmstadt Hbf.
31.3	..	Railway overbridge.	Line passes under DT line Darmstadt Nord to Hbf.
31.4	..	..	J (facing) right with line to Rps (C. and W.).
31.5	..	..	J (trailing) right with loop from Darmstadt-Schneilgen (Route 67), also DT line from Hbf.
	..	Road overbridge.	Line passes under main road, Odenbach-Darmstadt.

Km.	Stations	Engineering works	Details and facilities
32.4	DARMSTADT NORD	..	Passenger Station: 2 island platforms, 6 tracks. Line curves NE.
32.5	..	..	J (facing) right with ST s.o. line to Wiebelsbach-Heubach (distance 31.8 km.) and Ebertsh (34.9 km.) (Route 93a). Line diverges with a DT line to Kranichstein station.
33.6	..	Fly-over.	Line passes under ST line from Darmstadt Ost.
33.7	..	..	J trailing right with ST line from Ost station.
34.0	..	Bridge or culvert over stream	Line runs 6-track.
34.9	DARMSTADT-KRANICHSTEIN	..	MY. For details see above, Darm- stadt Hbf. ES RH. Tbl. W. SER. Wb (60 t). Line turns E.
35.8	..	..	..
38.5	..	Bridge or culvert over stream.	..
40.1	MESSEL	..	SER. Wb (32 t). Line crosses road.
40.3	..	..	Line curves SE.
42.9	..	..	J trailing right with ST s.o. branch line from Reinheim (distance from Dieburg 9.2 km.).
47.5	..	..	..
47.6	..	Bridge over R. Gersprenz.	..
47.8	DIETRO	..	SER. Wb (32 t). J (facing) left with ST s.o. line to Offenbach (distance 30.4 km.). Line crosses main road. Line curves NE.
48.1	..	(?) Bridge.	..
52.4	ALTHERM	..	SER. Wb (32 t).
52.9	..	Bridge or culvert over river (Die Taube Semd).	..
54.5	HERGERSHAUSEN	..	..
54.8	..	Bridge over R. Ricker.	..
56.1	..	(?) Bridge.	Line crosses road.
56.5	..	Bridge over R. Lander.	J (trailing) right with ST s.o. line from Wiebelsbach-Heubach (15.0 km.).
57.8	..	..	Line crosses road.
58.1	..	(?) Bridge.	..
58.3	BABENHAUSEN (HESS)	..	SER. Wb (50 t).
58.8	..	..	J (fly-over) right with ST s.o. line to Hanau (19.9 km.).
59.4	..	Fly-over.	Line passes under ST line to Hanau. J left with ST s.o. line from Hanau.
59.9	..	..	..
60.2	..	..	..
60.7	..	..	..
62.7	..	..	..
63.0	..	..	..
63.7	..	..	..
66.2	STOCKSTADT	..	SER. Wb (32 t). Line crosses main road.
66.3	..	..	..
66.5	..	Bridge over R. Main.	Line turns E.
66.9	..	..	..
68.1	MAINASCHAFF	..	Passenger station with restricted goods facilities.
68.7	..	Bridge over arterial road.	..
69.2	..	..	J (trailing) left with DT s.o. line from Hanau and Frankfurt (Route 93a).

Km.	Stations	Engineering works	Details and facilities
*72.3	ACHAFFENBURG	..	SER. Wb (30 t). Cr (10 t). ES (Aachaffenburg W). Tbl. W. MY. Capacity, 3,000 wagons per 24 hours. J for: ST s.o. lines (1) to Höchst (32.4 km.); (2) to Milttenberg (36.5 km.) and Wertheim (69.4 km.). Also with DT s.o. main line Frankfurt-Würzburg (Route 86).

ROUTE 93A
DARMSTADT (NORD)-EBERBACH

General Description

This line, although ST, is of some importance in linking *Route 93* and *97* to provide a route for traffic to Stuttgart via Neckarelz and Heilbronn alternative to that provided by the main lines via Mannheim and Heidelberg.

Heavy gradients may be experienced, as the line passes through hilly country, but they are minimized by following the winding course of rivers for the whole way.

Several minor rivers and streams are crossed en route and vulnerability is increased by two long tunnels, one at 30.3 km. (c. 1.1 km. long), and the other at 59.4 km. (c. 2.8 km. long), where the line passes from one valley to another.

In addition to the junctions at Eberbach, an important junction at Reinheim gives connection with the ST line, whilst at Reinheim (19.3 km.) and 25 km., less important single track local lines connect with Dieburg and Aschaffenburg respectively.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 81.5 km. (50½ miles).
3. TRACK:
Darmstadt Nord-Darmstadt Ost, double.
Darmstadt Ost-Eberbach, single.

4. MAXIMUM PERMISSIBLE AXLE LOAD:
Darmstadt Nord-Wiebelbach-Heubach,
20 metric tons.
Wiebelbach-Heubach-Eberbach,
16 metric tons.
5. MAXIMUM GRADIENT: 14 per mille (1 in 70).
6. MINIMUM RADIUS OF CURVES: 400 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS:
7.4 km. (4½ miles).
9. ENGINE SHEDS: Darmstadt.
10. MARSHALLING FACILITIES:
Darmstadt (Kranichstein).
11. WATERING FACILITIES: Darmstadt.
12. VULNERABLE POINTS: Marked with asterisk in text.
 - (a) Locomotive and marshalling facilities and RpS at Darmstadt—see Route 93.
 - (b) Junctions at Darmstadt, Wiebelbach and Eberbach.
 - (c) Tunnels at 30.3 and 59.4 km.—total length 4.313 m.
13. CAPACITY:

<i>Trains per day each way</i>	<i>Net train load tons military stores</i>
12-16	300

Distance from Darmstadt

Km.	Stations	Engineering works	Details and facilities
107.5	KARLSRUHE	(Route 67).	
32.4	MAINZ	(Route 93.)	
3.8	DARMSTADT Hbf.	See Routes 67 and 93.	
0	DARMSTADT NORD	..	Passenger, 2 island platforms, 6 tracks. J with DP & Co. lines running NE and then E to Aschaffenburg; also J with DP & Co. lines running E and then S to main station. Also J w. S. DP & Co. line running W to Mainz.
0.5	..	..	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 7

Km.	Stations	Engineering works	Details and facilities
0.4	J (trailing) left, with DT s.o. line Darmstadt-Babenhausen and Aschaffenburg (Route 93).
1.7	Line crosses minor road.
2.8	Line curves SE.
3.1	Line crosses arterial road.
3.3	Line crosses minor road.
3.5	Ditto
3.7	DARMSTADT ODT	..	SER. Wb (35 t).
4.0	J (facing) left, with ST s.o. line to Gross Zimmern (13.2 km.) and Reinheim (18.1 km.).
4.7	Line curves S.
5.5	..	Bridge or culvert over river.	
6.9	..	Ditto	
7.0	Line crosses 200 m. contour-line.
7.4	Line crosses minor road.
8.1	Line curves SE.
8.4	..	Ditto	
9.2	NIEDER RAMSTADT TRAHA	Ditto	SER. Wb (40 t).
9.7	..	Bridge or culvert over stream.	
11.6	..	Bridge over river.	
11.9	Line crosses main road, and turns E.
12.3	OBER RAMSTADT	..	SER. Wb (40 t).
13.0	Line passes over road nodal-point.
14.6	..	Bridge or culvert over stream.	
14.7	..	Ditto	
15.6	Line crosses minor road.
16.3	ZEILHARD	..	Passenger station.
17.7	Line crosses two minor roads.
19.3	J (trailing) right with ST s.o. DE line to Reichelsheim (17.9 km. from Reinheim).
19.7	Line crosses main road.
19.8	REINHEIM (ODENWALD)	..	SER. Wb (32 t).
20.1	J (facing) left, with ST s.o. line to Gross-Zimmern (4.9 km.) and Dieburg (9.2 km.).
20.7	..	Bridge over R. Wein.	
21.0	..	Bridge or culvert over stream.	
21.3	..	Ditto	
22.2	..	Ditto	
22.3	Line crosses 175 m. contour line.
23.3	..	Ditto	
23.6	..	Bridge or culvert over stream.	
24.9	LENGFELD	..	SER. Wb (32 t).
25.2	..	Ditto	
25.4	Line crosses 200 m. contour line.
26.3	..	Ditto	
27.6	J (trailing) left, with ST s.o. line from Babenhausen (15.0 km.) and Hanau (35.0 km.).
27.9	..	Ditto	
28.2	WIESELBACH-HEUBACH	..	SER. Wb (40 t).
28.4	..	Tunnel.	2.1 km.
28.7	..	Bridge or culvert over stream.	
29.1	Line turns S.
29.2	J (trailing) left, with ST s.o. line from Gross-Odenheim (21.2 km.) and Aschaffenburg (41.1 km.).

Km.	Stations	Engineering works	Details and facilities
34.0	WERNY (ODENWALD)		SER. Wb.
34.5	..	Bridge or culvert over stream.	
36.5	MÜMLING-GRUNBACH		SER. Wb (39 t).
36.7	..	Ditto	
38.7	..	Ditto	
38.6	..	Ditto	
39.6	..	Ditto	
40.5	KÄNIG (ODENWALD)		SER. Wb (32 t).
41.9	..		Line crosses main road.
42.3	..	Ditto	
42.6	ZELL-KIRCHENBOMBACH		SER. Wb (32 t).
			Line follows narrow valley of R. Mümling.
42.8	..		Line re-crosses main road.
45.0	..		Line re-crosses main road.
			Valley widens out.
45.5	..		Line re-crosses main road.
46.8	..	Ditto	
47.1	MÜCKELSTADT		SER. Wb (32 t). Cr (6.5 t).
47.3	..	Ditto	
47.5	..	Ditto	
47.8	..		Line re-crosses 200 m. contour line, and ascends gradually to Erbach.
50.4	..	Ditto	
50.5	ERBACH (ODENWALD)		SER. Wb (32 t).
50.9	..	Ditto	
51.0	..	Ditto	
51.2	..	Ditto	
52.8	..	Ditto	Valley narrows, and line continues to ascend gradually.
54.4	..	Ditto	
55.2	..	Ditto	
56.8	..	Ditto	
57.9	HETZBACH		SER. Wb (40 t).
			J (facing) right, with short DE line to Beerfelden (5.1 km.).
58.4	..		Line turns SE.
			Line crosses road.
*59.4	..	Tunnel.	c. 2.8 km. long.
63.1	SCHÖLLENBACH		SER. Wb (32 t).
65.8	..		Line turns SSE to follow river valley to Eberbach.
67.2	..		Line turns SSW.
68.4	KARBACH		SER. Wb (40 t). Cr (2 t).
			Line curves considerably along river valley.
			Line crosses small stream.
72.5	..		Line crosses small stream and turns SE.
74.0	..	(?) Bridge over river.	
74.5	GAUMÜLLE		SER. Wb (40 t). Cr (3 t).
			Line turns S.
75.2	..	Bridge or culvert over stream.	
75.7-80.7	..	10 bridges or culverts over stream.	
*81.4	..		J (trailing) right, with DT s.o. line from Heidelberg (R. 27 97).
81.5	EPYRBACH		SER. Wb (35 t). Cr (4 t).
81.3	NEUKIRCH	(R. 27 97.)	

ROUTE 94

(KAISERSLAUTERN)-LANOMMEL-WORMS-BIBLIS-GROSS GERAU-FRANKFURT

General Description

Connecting with *Route 60* at Langmell, this line provides a main line service from the Saar to Frankfurt and beyond.

Important junctions at Worms (with *Route 92*), Goddelau-Erfelden and Gross Geran, give through main line services to Mainz, Darmstadt and Wiesbaden, whilst at Biblis the line is joined by the main line from Mannheim (*Route 95*). Less important, although by no means unimportant, junctions at Mannheim and Monsheim (*Route 92a*) connect with the ST lines to Binger-rück (*Route 54*) and Mainz.

The line takes a general direction E along the valley of the R. Pfimm to Worms when it turns NE crossing the Rhine at 41.7 km. by a bridge 961 m. long, and the Main at 98.8 km. by a bridge 283 m. long.

Contours are even for most of the route and gradients as well as curvature will be easy.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 100.0 km. (62½ miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.

5. MAXIMUM GRADE: 9 per mille (1 in 110).

6. MINIMUM RADIUS OF CURVES: 352 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS: 9.1 km. (5½ miles).

9. ENGINE MILES: Worms, Frankfurt Hbf.

10. MARSHALLING FACILITIES: Frankfurt.

11. WATERING FACILITIES:

Worms.

Frankfurt Hbf.

12. VULNERABLE POINTS:

(a) Marshalling and locomotive facilities as well as Rps at Frankfurt. Also locomotive facilities at Worms.

(b) Junctions at Mannheim, Monsheim, Worms, Goddelau-Erfelden, Gross Geran and Frankfurt.

(c) Bridges at 13.3 km., 41.7 km., and 98.8 km.

13. CAPACITY:

Trains per day
each way
72

Not train load tons
military stores
500

Distance from Langmell

Km.	Stations	Engineering works	Details and facilities
16.5	KAISERSLAUTERN	(Route 60).	
6.0	HOCHSPEYER	(Route 60).	
0	LANOMMEL	..	SER. Wb (20 t).
7	..	..	J (facing) left with DT a.o. line to Bad-Münster (Route 60). Line turns NE.
6.2	BÖRSTADT	..	SER. Wb (40 t).
6.8	..	Bridge or culvert over stream.	
7.4	..	Bridge over road and river (Pfimm).	Line continues along valley of Pfimm. Line crosses main road.
11.0	..	..	SER. Wb (35 t).
11.0	GÖLLHEIM-DÄHLEN	..	
11.3	..	Bridge or culvert over stream.	Line curves NNE.
12.3	..	..	Total length 260 m. spans 2 x 60 m. + 2 x 50 m.
13.3	..	Bridge over valley.	Lattice girder deck spans on steel trestle piers; stone arch approach spans.
14.1	MANHHEIM	..	SER. Wb (35 t).
14.6	..	Bridge over main road.	J (fly-over) right with ST line to Alzey (20.1 km.) and Mainz (61.3 km.).
15.2	..	Railway overbridge.	Line passes under ST line at Alzey and curves NE.
19.1	ALZEY (Pfimm)	..	SER. Wb (40 t).
21.8	..	Bridge or culvert over stream.	Line turns E. Line crosses road.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
22.2	Flaunheim-Zell	..	SER. Wb (35 t). Cr. (2 t).
24.4	Walldorf-Mörschen	..	SER. Wb (35 t). Cr. (2 t).
24.4	..	..	Line crosses main road.
25.9	..	..	J (trailing) left with ST s.o. line from Alsey (17.5 km.).
27.0	..	Bridge over main road.	
27.5	Mörschen	..	SER. Wb (34 t). Cr. (3 t).
27.9	..	..	J (facing) right with ST s.o. line to Grünstadt (9.6 km.) and Neustadt (32.8 km.).
30.6	..	..	Line crosses main road and turns NE.
31.5	..	..	Line crosses main road.
32.9	Freudenheim	..	SER. Wb (34 t). Cr. (5 t).
33.2	..	..	Line crosses main road.
33.8	..	..	Ditto
35.6	..	..	Line turns SE.
36.1	Worms-Friedelsheim	..	Line crosses main road.
37.3	..	..	Restricted goods facilities.
38.4	..	..	Line turns N.
39.0	Worms	..	J (trailing) right with DT s.o. line from Ludwigshafen (Route 92).
39.5	..	..	SER. Wb (40 t). Cr. (10 t). ER.
40.8	..	..	Tbl. W.
41.3	Worms-Büschel	..	J (facing) left with DT s.o. line to Mainz (Route 92).
41.7	..	..	Line bears E.
42.6	..	(?) Bridge	Line crosses road.
43.9	..	..	Passenger station.
44.1	..	..	961 m. long.
44.6	Hornheim (Rind)	..	3 main steel arch spans on stone piers (2 x 102.2, 1 x 116.8 m.).
45.2	..	..	17 steel-braced girder deck approach spans (16 x 34.5 m., 1 x 34.2 m.).
47.0	..	Bridge over Altrhein.	J (facing) right with ST s.o. line to Lampertheim (distance 12.6 km.).
47.3	..	..	Line turns NE to run through flat country.
47.5	..	..
48.3	..	(?) Bridge over R. Rhine.	
49.0	Jülich	..	SER.
50.9	..	..	J (facing) right with ST s.o. line to Büttstadt (4.6 km.) and Bensheim (18.2 km.).
51.4	..	..
52.3	Gross Rottum	..	SER. Wb (40 t).
52.8	..	..
53.4	..	..	SER. Wb. (34 t).
53.9	..	..	Line turns N.
54.2	..	..
55.1	Gernheim	..	SER. Wb (40 t). Cr. (10 t).
55.6	..	..	Line turns NNW.
56.1	..	..

(KALBERSLAUFERN) TO FRANKFURT

75

Km.	Stations	Engineering works	Details and facilities
60.5 61.0	BERNHARD	Bridge over R. Mordas and Yang-Ch.	SER. Wb (40 t). Cr (3 t).
60.9	..	..	Line turns NE.
63.7 64.0	STOCKSTADT	Bridge or culvert over stream.	SER. Wb (34 t).
64.7 65.1	..	(?) Bridge over road. Bridge over R. Schwarz.	
66.6 67.1	GOODTAU-EASFELDEN	..	SER. Wb (34 t). Cr (3 t). J (facing) right with DT s.o. main line to Darmstadt Hbf (16 km.). Line runs due N.
69.0 69.1 70.0	LEHMEN-WOLFSHEIMEN	.. Bridge over arterial road.	SER. Line crosses minor road.
70.3	..	Bridge or culvert over stream (Scheld-Gr).	
71.0	..	Ditto	
71.3 71.9	DORNHEIM	Bridge or culvert over stream.	SER.
73.7 74.0 75.0	..	Ditto 4 bridges or culverts over stream.	
75.4 76.0	GROSSE GERAU DORNHEIM	..	SER. Wb (40 t). J (facing) left with DT s.o. main line to Mainz (distance 21.6 km.) and Wiesbaden (31.3 km.). Line passes over main DT s.o. line Mainz-Darmstadt (Route 33). Line turns NE.
76.7	..	Bridge over railway.	
76.9 82.4	..	Bridge or culvert over river. Bridge over R. Heeg and tributary.	
82.6 83.4	..	.. Bridge over R. Geraths.	Line crosses arterial road.
84.3	MÖRTELDEH	..	SER. Wb (33 t).
87.2 89.1 91.4	WALLDORF (HESS)	..	SER. Wb (40 t). Line crosses arterial road. Line crosses main road.
91.3 94.6 95.4	LUTTHAFEN-RHEIN-MAIN	..	SER. Line crosses arterial road. J (trailing) left with DT s.o. main line from Mainz (Route 34). Line turns E and runs common with Route 34.
95.7 96.4	FRANKFURT-SPORTFELD (GOLDSTEIN)	..	Line turns N. J triangular with DT main line to Neu Isenburg Darmstadt (Route 67) and Frankfurt Sud (Route 38)—distance to Neu Isenburg 4.0 km., to Frankfurt Sud 3.7 km.
98.1 98.6	FRANKFURT-NIEDERRAD	Bridge over R. Main.	SER. Wb (33 t). J triangular with DT main line to Neu Isenburg Darmstadt (Route 67) and Frankfurt Sud (Route 38)—distance to Neu Isenburg 4.0 km., to Frankfurt Sud 3.7 km.

Km.	Stations	Engineering works	Details and facilities
*99-1	..	..	J (leading) left with (1) DT s.o. line to Frankfurt-Oriental (Route 53) and new loco. depot; (2) DT s.o. line to main goods station and also to Frankfurt-Höchst, and loco. RPS.
		Bridge over railway.	Line passes over loop line from new loco. depot and DEW H.
*99-1	..	..	J (leading) right, with connection to loco. depot and carriage siding.
		Railway overbridge.	J (trailing) left with DT s.o. main line from Frankfurt-Oriental and Koblenz (Route 53).
		Railway overbridge.	Line passes under ST line from Bad Homburg.
			Bridge traverses all tracks into main passenger station and carries DT line from Frankfurt W and main goods station to Frankfurt Süd, and Frankfurt Louise.
*100-0	FRANKFURT Hbf.	..	Passenger Station (Terminals): 13 platforms (covered), c. 400 m. long.
			Loco. Depot: W of station, ES Rectangular. 2 Tbls (25 m.). V1.
	FRANKFURT Hbf.	..	Goods Yard: SER. Wb (51 t). Cr (25 t).
			1 large goods shed served by 10 DE tracks.
			12 DES (c. 800 m.) in yard, 6 with road access.
			Loco. Depot: W of goods yard.
			2 ES, RH type, 1 disused.
			2 Tbls (25 m.). W. A further Tbl was reported to be in process of construction in October, 1949.
			RPS: (Passenger and goods rolling stock). Goods yard served by 20 DE tracks—estimated total staff c. 2,300.
			Marshalling Yard:
			Reception sidings: 8 LS (c. 600 m.).
			Sorting sidings: 22 LS (c. 700 m.).
			Storage sidings: 7 DES (c. 700 m.).
			Capacity: 2,700 wagons per 24 hours.
	FRANKFURT-NIED	(Route 52).	RPS (Loco.): Estimated total staff c. 3000.
	FRANKFURT-ORIENTAL	(Route 52).	ES (rectangular) (c. 160 x 100 m.) served by c. 2 through tracks.
	FRANKFURT OST	(Route 86).	c. 3 island platforms c. 300 m. long.
			SER. Wb (60 t). Cr (30 t).
			Marshalling Yard:
			Reception or departure sidings: 12 LS (c. 500 m.).
			Marshalling sidings: 18 LS (c. 500 m.).
			Sorting sidings: 12 LS (c. 300 m.).
			Holding sidings: 10 LS (c. 560 m.).
			Loco. Depot:
			ES (RH). Tbl (25-30 m.). W.
			Several DES, c. 560 m.
			For air photographs of Frankfurt Main and Ost see Plans 28 c, and for location diagram, Plan No. 28.

ROUTE 95
MANHHEIM-BIBLIS

General Description

This line, which is DT throughout, connects the important railway centre of Mannheim with the main line from Worms, K. verslautern and Saarbrücken to Darmstadt and Frankfurt at Biblis (Route 94), and together with Route 94, provides a main line service between Mannheim and Frankfurt alternative to that provided by Route 67.

The line follows the right bank of the Rhine through flat country and no heavy gradients or restrictive curvatures are likely to be encountered.

The principal bridges en route are those over the Neckar at 3.8 km., and over the Weschnitz at 26.9 km.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 28 km. (17½ miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 5 per mille (1 in 200).

6. MINIMUM RADIUS OF CURVE: 500 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 6.3 km (4 miles)
9. ENGINE SHEDS:
Mannheim HtC. Mannheim MY.
10. MARSHALLING FACILITIES: Mannheim.
11. WATERING FACILITIES: Mannheim.
12. VULNERABLE POINTS: Marked with asterisk in text.
(a) Marshalling and locomotive facilities at Mannheim.
(b) Junctions at Mannheim and Biblis.
(c) Bridges at 3.8 km. and 26.9 km.
13. CAPACITY:

<i>Trains per day</i>	<i>Net train load tons</i>
<i>each way</i>	<i>military stores</i>
16	300

Distance from Mannheim

Km.	Stations	Engineering works	Details and facilities
140.2	SAARGEMÜND	Routes 60 and 65.	
61.8	KAMMERLAUTERN	Route 65.	
39.5	GERMERSHEIM	Routes 65 and 69.	
79.6	KARLSRUHE	Routes 65, 69, and 66.	
0	MANHHEIM		

Passenger Station: 8 platforms (7 island) 300-400 m. long.

Carriage sidings—E of passenger station—16 LS (c. 500 m.) and 16 LS (c. 400 m.).

2 carriage-sheds S of main line.

Main Goods Station (between confluence of Rhine and Neckar): SER. Wb (60 t). Cr (20 t). Reading W to E, c. 10 DES (c. 360 m.), 4 LS (450-540 m.) terminating in shunting neck with connections to quay sidings on left bank of Neckar.

c. 10 LS (1,200-1,600 m.)—all for holding traffic from port and with connections to quays and warehouses.

Marshalling Yard: Hump type, E of passenger station and S of main line (capacity 7,000 wagons per 24 hours).

Eastbound Yard:

Reception sidings: 17 LS (c. 800 m.).

Marshalling sidings: 42 LS (c. 800 m.).

Departure sidings: 18 LS (c. 800 m.).

Sorting sidings: 14 LS (c. 270 m.).

Westbound Yard:

Reception sidings: 8 LS (c. 800 m.).

Marshalling sidings: 22 LS (c. 730 m.).

Departure sidings: 6 LS (c. 500 m.).

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
			Sorting sidings: 14 LS (c. 270 m.).
			Locs' departure sidings: c. 8 LS (c. 500 m.).
			2 tranship sheds served by c. 8 LS.
			Locs. Depot—between up and down yards. ES rectangular (c. 300 x 60 m.)—with Tbl each end.
			See photographs and location diagram, Plans 31, 31a, and 31b.
15	..	..	J (facing right), with DT s.o. line to Karlsruhe (Route 67), also main line (multiple track) to Heidelberg (Route 97).
			J (trailing) right with DT s.o. line from MY.
25	..	..	Line crosses arterial road.
29	..	..	Line crosses main road.
30	..	..	Ditto
38	..	Bridge over R. Neckar.	c. 400 m.
44	..	..	Line curves NW.
46	..	..	Line crosses tramway to Feudenheim.
63	MANHEIM-KÄPFTAL	..	SER. Wb (100 t).
65	..	..	Line crosses main road.
68	..	..	Line crosses tramway to Weinheim.
92	..	..	J (trailing) left, with ST line from Mannheim-Neckarstadt (6.4 km.).
94	MANHEIM-WALDROF	..	SER. Wb (40 t). Cr (5 t).
			Line runs N for straight stretch, c. 7.2 km. long.
97	..	..	J (trailing) left, with ST line from Mannheim-Neckarstadt.
119	..	..	Line crosses arterial road under construction.
136	SANDTORF	..	Passenger station.
143-162	..	6 bridges over river.	Line passes under ST line from Weinheim.
163	..	Railway overbridge.	Line turns NW and begins straight stretch, c. 10.2 km.
166	..	..	J (trailing) left, with ST line from Weinheim (18.2 km.).
169	..	..	..
175	LAMPERTHEIM	..	SER. Wb (40 t).
180	..	..	J (facing) left, with ST line to Worms (distance c. 12.6 km.).
226	..	..	Line crosses main road.
		Railway overbridge.	Line passes under ST branch line to Bensheim.
229	BÜBSTAT	..	SER. Wb (34 t).
		..	J with ST line Hofheim-Bensheim.
		..	(Distance to Hofheim: 4.6 km.
		..	Distance to Bensheim: 13.6 km.)
242	..	Bridge over .. Mühlgraben.	..
249	BÖBSTAT	..	Restricted goods facilities.
254	..	Bridge over river and main road.	..
262	..	Bridge over river.	..
269	..	Bridge over R. Weschnitz.	c. 150 m.
273	..	..	J (trailing) left, with DT s.o. line Darmstadt-Worms (Route 94).
276	..	..	Line crosses minor road.
280	BIRN	..	SER. Wb (40 t).
		..	Line continues to Darmstadt and Frankfurt at Route 94
616	DARMSTADT	} Scale 94.	..
800	FRANKFURT		..

ROUTE 7A

FRANKFURT-HANAU-SCHLÜCHTERN-ELM-GEMÜNDEN-WAIGOLSHAUSEN

General Description

This line provides an alternative though devious route from Frankfurt to Gemünden to that provided by Route 86, and from Gemünden to Waigolshausen offers a direct link from the Frankfurt area to Schweinfurt and Bamberg.

From Frankfurt to Schlüchtern the route is part of the main line to Berlin via Fulda, and from Elm to Gemünden, part of the main line from Hamburg and Hanover to München.

The line runs through the Main valley to Hanau, where it turns NE through the Wolfgang Forest and low-lying country to Gelnhausen, to enter the valley of the R. Kinzig which it follows to Schlüchtern.

After leaving Elm, the country becomes more hilly, and several tunnels are encountered before the line runs down the valley of the R. Sinn as far as Gemünden, whence it follows the Main valley to Wernfeld and finally the Wern valley to Waigolshausen.

The most serious gradients and curvatures are likely to be encountered between Elm and Jossa, although curvature will be fairly severe throughout.

Several bridges are crossed, the most important being those over the R. Main and R. Kinzig referred to under item 12 below.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.

2. LENGTH: 168.1 km. (104½ miles).

3. TRACK:

Frankfurt-J at 77.4 km., double.

J at 77.4 km.-Mottgers (18.8 km.), single.

Mottgers-Jossa (9.0 km.), double.

Jossa-J at 126.7 km. (21.5 km.), single.

J at 126.7 km.-J at 131.4 km. (4.7 km.), double.

J at 131.4 km.-J at 167.0 km. (35.6 km.), single.
J at 167.0 km.-Waigolshausen (1.1 km.), double.

4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.

5. MAXIMUM GRADIENT: 13 per mille (1 in 77).

6. MINIMUM RADIUS OF CURVES: 190 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

8.4 km. (5½ miles).

9. ENGINE SHEDS:

Frankfurt (Main and Ost).

Hanau.

Gemünden.

10. MARSHALLING FACILITIES:

Frankfurt (Main and Ost).

Hanau.

11. WATERING FACILITIES:

As in 9 above. No other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Locomotive and marshalling facilities given in 9 and 10.

(b) Junctions at Frankfurt, Hanau, Gelnhausen, Elm, Gemünden and Waigolshausen.

(c) Bridges at 1.2, 21.3, 30.8, 45.3, 59.1, 62.2, 122.0, 123.6, 124.4 and 127.0 km.

(d) Tunnels at 85.1, 89.8, 94.1, 102.5 and 105.9 km.

13. CAPACITY:

Trains per day Net train load tons
each way military stores

Frankfurt-J at 77.4 km. 72 500

J at 77.4 km.-Waigolshausen 16 400

Distances from Frankfurt

Km.	Stations	Engineering works	Details and facilities
0	FRANKFURT	..	SER. Wb (51 t). Cr (25 t). 4 ES (2 RH and 2 rectangular). Tbl. W. MT: Capacity 2,700 per 24 hours, a further MT at Ost station (Route 86). PAS: Passenger and goods rolling stock—total number employed c. 2,700. For details of facilities, see Route 94.
0.4	..	..	Triangular J with DT line from Frankfurt-West. Line curves S.
1.2	..	Bridge over R. Main.	Total length 283.3 m. spans 5 x 52.84 m.
2.0	..	..	J (facing) right, with DT line to Darmstadt (Route 67).
2.7	..	..	Line curves E. J (trailing) right, with DT line from Darmstadt (Route 67).
14	FRANKFURT SLD	Goods station.	SER. Wb (30 t). Cr (20 t). J (trailing) right, with DT line from Frankfurt Sportfeld.
18	..	..	..
41	FRANKFURT SLD	..	Passenger station. Restricted good. facilities.
51	..	..	J (facing) right, with DT line to Frankfurt Ost (Route 86).
54	..	Relay over bridge.	Line passes under DT line to Frankfurt Ost.
			ST local line to Offenbach runs parallel with main line.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
7.3	FRANKFURT-OBERRAD	..	Restricted goods facilities.
* 7.7	..	..	J (facing) left, with ST local line to Offenbach (4.7 km.).
10.0	OFFENBACH (MAIN) Hbf.	..	Wb (60 t). Cr (30 t). SY.
11.6	OFFENBACH (OST)	..	Passenger station.
12.1	..	..	J (facing) right, with ST line to Dieburg (30.5 km.).
12.5	..	..	Line curves NE.
12.7	..	..	Marshalling sidings.
16.0	MÜHLHEIM (MAIN)	..	SER. Wb (35 t).
20.7	..	..	Line crosses main road.
21.1	STEINHEIM (MAIN)	..	Wb (30 t). SER.
*21.3	..	Bridge over R. Main.	Total length 233 m. Spans 3 x 45.84 m., braced steel girder through spans on stone or concrete piers.
21.7	..	..	J (facing) right, with ST s.o. line to Babenhausen.
22.1	..	..	Line curves SE.
			Line crosses DT line from Frankfurt.
*22.9	HANAU Hbf.	..	Wb (30 t). SER. Cr (5 t). ES. Tbl. W. MY.
*23.7	..	..	J (facing) right, with DT s.o. line to Windecken.
24.8	..	..	Line curves NE.
			Line passes over DT s.o. line to Windecken.
*25.1	..	..	J (trailing) right, with loop connection with DT s.o. line to Aschaffenburg (Route 86).
25.2	WOLFGANG	..	Passenger station.
			Line begins straight stretch NE, c. 14.5 km. long.
30.2	NIEDERRODENBACH	..	Passenger station.
*30.8	..	Bridge over R. Lache	
33.8	LANGENSELBOLD	..	SER. Wb (40 t).
			J (facing) left, with ST standard gauge light railway to Gelnhausen (20 km.).
34.9	..	..	Line crosses ST s.o. line to Gelnhausen.
37.1	..	Bridge over stream.	
38.0	NIEDERMITTLAU	..	Passenger station.
40.8	..	..	Line crosses road.
41.2	MEERHOLE	..	Line crosses road.
43.4	..	..	Wb (30 t). SER.
43.6	..	..	J (trailing) left, with ST s.o. line from Stockheim (23.3 km.).
44.0	GELNHAUSEN	..	Line crosses road.
			Wb (32 t). Cr (6 t). SER.
			I with narrow-gauge line to Bieber.
			J with ST s.o. line from Langenselbold (20 km.).
			At this point, line leaves open country and follows narrow valley of R. Kinzig.
*45.1	..	Bridge over R. Kinzig.	
48.4	..	..	Line crosses road.
49.2	..	..	Line curves E.

Km.	Stations	Engineering works	Details and facilities
50.4	WIRTZIM	..	Passenger station.
50.9	..	..	Line curves N.
53.9	..	..	J (trailing) right, with ST s.o. line from Bad Orb (6.5 km.).
54.7	WÄCHTERSACH	..	SER. Wb (35 t).
55.0	..	..	J (facing) left, with ST s.o. local line to Hartmannshain (31.6 km.).
55.1	..	..	Line turns E.
*58.1	..	Bridge over R. Kinzig.	c. 100 m.
59.7	..	..	Line curves N.
61.3	SALMÜNSTER-BAD SODEN	..	Wb (40 t). SER.
62.2	..	Bridge over R. Kinzig.	c. 100 m.
68.0	STEINAU	..	Wb (4 t). SER.
70.4	..	..	Line crosses road.
74.3	SCHLÜCHTERN	..	Wb (35 t). SER. Cr (1.25 t).
75.9	..	..	Line crosses road and turns N.
77.3	..	..	Line curves E.
*77.4	..	..	J (facing) left, with DT s.o. line to Fulda, Bebra, and Erfurt.
78.2	..	..	End of DT, beginning of ST.
78.2	..	..	Line crosses road.
*82.1	ELM	..	Wb (35 t). SR. Cr (1.25 t).
83.3	..	..	J (trailing) left, DT. s.o. line from Fulda. Line curves sharply S.
83.9	..	..	J (trailing) left, with spur, c. 0.4 km. long. Line follows winding course to Sterbfritz, skirting hills.
*85.1	..	Tunnel.	c. 300 m.
85.5	..	Road overbridge.	
87.2	..	Bridge over road.	c. 50 m.
88.6	VOLLMERZ	..	SER. Wb (40 t).
*89.8	..	Tunnel.	c. 600 m.
93.6	STERBFRITZ	..	Wb (35 t). SER.
*94.1	..	Tunnel.	c. 1.2 km.
96.2	MOTTIGERS	..	End of ST beginning of DT.
96.2	..	..	Passenger station.
96.2	..	..	Line runs above valley of R. Schmale Sinn, and follows this valley for the rest of the journey.
102.0	ALTENORONAU	..	Passenger station.
*102.5	..	Tunnel.	c. 200 m.
102.6	..	..	Embankment across valley.
103.9	..	..	(trailing) left, with ST s.o. line from Wildflecken.
104.2	..	..	Line crosses road.
105.2	JOSSA	..	Wb (40 t). SER.
*105.9	..	Tunnel.	c. 400 m.
106.0	..	..	Line crosses road and valley of R. Sinn.
109.9	..	..	Line crosses road.
110.4	MITTELSINN	..	Wb (40 t). SER.
110.4	..	..	Line descends into valley.
115.3	BURGINN	..	Wb (40 t). SFR.
121.3	..	..	Line crosses spur of hills.
*122.0	..	Bridge over R. Sinn.	c. 50 m.
122.4	RIFNECK	..	SER. Wb (40 t).
*123.0	..	Ditto	c. 50 m.
*124.4	..	Ditto	c. 50 m.
126.3	..	..	Line crosses road.
126.4	..	..	J (trailing) left, with ST s.o. branch from Bad K. Soden (1.7 km.).

Km.	Stations	Engineering works	Details and facilities
*126.7	..	..	J (trailing) right, with DT s.o. line from Aschaffenburg (Route 86). Beginning of DT.
*127.0	..	Bridge over two streams.	8 spans. See photograph 24.
*128.3	GEMÜNDEN (MAIN)	..	Wb (30 t). SER. ES. Tbl. W. Line runs SE.
131.4	WERNFELD	..	SER. Wb (31 t). Beginning of ST.
131.6	..	..	J (facing) right, with DT s.o. line to Würzburg (Route 86).
132.6	..	..	Line curves E.
134.0	..	Bridge or culvert over stream.	Line curves ESE.
134.7	..	..	Line turns SE.
135.2	GÖSENHEIM	..	SER. Wb (32 t). ^o
136.5	..	..	Line crosses arterial road under construction.
138.9	..	Ditto	..
139.1	..	Ditto	..
139.3	..	..	Line crosses main road.
139.5	..	..	Line curves S.
139.7	..	Ditto	..
139.9	EUSENHEIM	..	SER. Wb (31 t).
141.0	..	..	Line curves SE.
143.2	..	..	Line turns S.
143.4	..	Ditto	..
143.6	..	Ditto	..
143.9	..	..	Line reaches 200 m. contour line.
144.3	..	..	Line curves SE.
144.4	..	Ditto	..
144.7	..	..	Line crosses main road, and arterial road under construction.
146.2	..	..	Line curves E.
146.9	TEÜNGEN	..	SER. Wb (40 t).
148.2	..	..	Line curves NE.
149.7	..	Ditto	..
151.8	MÜDESHHEIM	..	SER. Wb (31 t).
154.0	..	..	Line curves E.
156.4	ARNSTEIN (MAINFR.)	..	SER. Wb (40 t).
157.2	..	Bridge or culvert over stream (Wern).	..
159.2	..	..	Line crosses main road.
159.9	..	..	Line curves SE.
160.0	..	Bridge or culvert over stream.	..
160.3	GÄNNHEIM	..	Passenger station.
160.4	..	Bridge or culvert over stream (Wern).	..
160.9	..	Bridge or culvert over stream (Bins).	..
161.1	..	..	Line curves E.
162.1	..	Bridge or culvert over stream (Riedener).	..
162.5	MÜHLHAUSEN (WERN)	..	SER. Wb (31 t).
162.6	..	1 lge over stream.	..
162.8	..	..	Line turns NE.
163.2	..	Bridge over stream (Weid-leins).	..
165.0	..	..	Line curves SE.
165.8	..	..	Line crosses main road.
166.9	..	..	Line curves NE.
*167.0	..	..	J (trailing) right, with DT s.o. line from Würzburg (Route 100).
167.5	..	Bridge over stream (Class 2).	..
168.1	WARGOLSHAUSEN	..	SER. Wb (40 t).
		..	Line continues DT to Schweinfurt, 16.8 km.

ROUTE 97

MANNHEIM-HEIDELBERG-NECKARGEMÜND-NECKARETZ-OSTERBURKEN

General Description

Together with Route 99, this forms the main line from Mannheim to Würzburg and NE Germany.

The line runs through flat country to Heidelberg with a gradually rising gradient, but after Heidelberg it enters the hilly region of the Odenwald and more difficult gradients may be expected.

To minimize gradients, the line follows the R. Neckar, involving many curves, bridges over tributaries and several tunnels where bends in the river are too sharp for the line to follow.

An alternative route is provided between Neckargemünd and Neckarelz by a ST line via Meckesheim, junction also for the ST line to Jagstfeld (Route 97a).

The principal junctions are at Heidelberg with the main lines from Bruchsal and Karlsruhe, at Eberbach with the ST line from Darmstadt (Route 93a), at Neckarelz, with the main line from Heilbronn, and at Osterburken with the main line from Jagstfeld, Heilbronn and Stuttgart.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 101.6 km. (63 miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE LOAD:
Mannheim-Eberbach, 20 metric tons.
Eberbach-Seckach, 18 metric tons.
Seckach-Osterburken, 20 metric tons.
5. MAXIMUM GRADIENT: 15 per mille (1 in 66).

6. MINIMUM RADIUS OF CURVES: 300 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:
6.2 km. (3½ miles).

9. ENGINE WHEELS:

Mannheim. Neckarelz.
Heidelberg.

10. MARSHALLING FACILITIES:

Mannheim. Heidelberg.

11. WATERING FACILITIES:

Mannheim. Heidelberg.
Neckarelz.
No other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Marshalling and locomotive facilities given in 9 and 10 above.

(b) Junctions at Mannheim, Heidelberg, Neckargemünd, Eberbach, Neckarelz and Osterburken.

(c) Bridges at 8.7, 14.1 and 29.0 km.

(d) Tunnels at 18.8, 19.9, 28.8, 41.3, 43.3, 49.4, 63.9, 84.7, 93.7, 94.8 and 98.0 km.

13. CAPACITY:

Trains per day each way	Net train load tons military stores
60-72	500

Distance from Mannheim

Km.	Stations	Engineering works	Details and facilities
	SAARGEMUND	Routes 65 and 67.	
	KARLSRUHE	Routes 64, 69, and 66.	
*0	MANNHEIM Hbf	..	SER. Wb (60 t). MY (capacity 7,000 wagons per 24 hours). ES. Tbl W. RpS (passenger stock). Fo (detailed description see Route 94). Line proceeds 6-track in a SE direction.
0.3	..	Road overbridge.	
*0.8	..	..	J (facing) right with DT s.o. line to Schwetzingen and Karlsruhe.
*0.9	..	..	J (facing) left, with DT s.o. line to Mannheim-Käfertal, and Biblis (Route 95). Line passes under DT s.o. line from Biblis (Route 95) to MY.
		Fly-over.	J (facing) right, to RpS, loco. depots and MY.
3.0	..	Road overbridge.	
3.6	MANNHEIM Rbf	..	Passenger station for railway personnel.
5.4	..	Ditto	
5.8	MANNHEIM-SECKENHEIM	..	Restricted goods facilities.
7.3	..	Ditto	
*8.1	..	..	J (facing) left, with DT s.o. line to Darmstadt (Route 67). J (facing) right with DT s.o. line to Schwetzingen (distance 7.5 km.).

Km.	Stations	Engineering works	Details and facilities
8.7	MANHEIM-FRIEDRICHS- BRIL SÜD	..	Passenger station.
..	..	Railway overbridge.	Line crossed by Karlsruhe-Darm- stadt line (Route 67).
*9.1	J (trailing) left, with DT s.o. line from Darmstadt (Route 67).
10.1	..	Bridge over minor road.	..
11.1	..	Road overbridge.	..
13.3	..	Ditto	Line passes under Autobahn.
14.1	..	Ditto	J (fly-over) left with connection to main line from Bruchsal (Route 98).
*14.3
14.4	HEIDELBERG-WIESLINGEN	..	Passenger station.
14.7	..	Road overbridge.	Line runs E to main station.
*15.0	J (facing) right with DT s.o. line to goods station and loop line to Karlsruh via Königstuhl tunnel (2,487 m. long).
*15.1	..	Fly-over bridge.	Line passes over main line from Bruchsal and Karlsruhe (Route 98).
*16.1	J (trailing) right, with ST line from Schwetzingen.
*16.6	J (facing) right, with DT main line to Bruchsal and Karlsruhe (Route 98).
*17.0	HEIDELBERG	..	Goods station.
..	SER. Cr (20 t). Wb (80 t). MY.
*17.6	ES. Tbl. W.
..	J (trailing) right, with DT main line from Bruchsal (Route 98).
18.2	HEIDELBERG	..	Passenger station. ES. Tbl. W.
..	For location diagram of Heidelberg see Plan 48.
18.8	..	Tunnel.	Line runs NE.
*19.9	..	Tunnel.	c. 400 m. long.
..	c. 950 m. long.
20.3	HEIDELBERG KARLSRUH	..	Restricted goods facilities.
..	J with ST loop line from Heidel- berg-Wieslingen via König- stuhl tunnel (2,487 m. long).
21.1	Line follows left bank of R. Neckar.
..	Line turns SE.
22.6	JÄGERHAUS-WOLFSBRUNNEN	..	Passenger station.
23.7	SCHLIERBACH-ZIEGL- HAUSEN	Road overbridge.	SR.
26.3	Line curves S.
..	Line curves sharply E round river- bend, radius c. 300 m.
*27.9	NECKAROMMUND	..	SER. Wb (35 t). Cr (6 t).
..	J (facing) right, with DT line to Jagstfeld (46.3 km. long).
28.3	..	Bridge over road, river and road.	..
*28.8	..	Tunnel.	c. 300 m.
..	J (trailing) right, with line from Jagstfeld.
..	Line curves NE.
29.1	..	Bridge over R. Neckar.	Line curves E, to follow right bank of river.
29.7	Line curves N.
30.3	..	Bridge over road.	..
31.3	..	Bridge over tributary of R. Neckar.	Line curves S, radius c. 600 m.
32.3	J (trailing) left, with ST DE line from Schenau (5 km. long).

Km.	Stations	Engineering works	Details and facilities
33.5	NECKARSTEINACH		SER. Wb (40 t). Cr (2 t).
33.9	..	Bridge over road.	Line curves NE.
34.4	..		
34.8	..	Bridge over road.	
37.5	NECKARHAUSEN	..	SER. Wb (35 t).
40.8	HIRSCHHORN		SER. Wb (40 t). Cr (6 t).
41.2	..	Bridge over tributary of R. Neckar and road.	
41.3	..	Tunnel.	c. 300 m.
42.6	..		Line turns S.
43.3	..	Tunnel.	c. 550 m.
			Line turns N and then E.
46.4	EIBERBACH-FLUTERSBACH	..	Wb (40 t).
			Facilities only to deal with wagon loads and cattle.
47.4	..	Bridge over road, stream and road.	
48.6	..		Line turns S.
48.9	..		J (trailing) left, with ST s.o. line from Wiebelsbach-Heubach-Hanau-Darmstadt (Route 930).
49.1	EIBERBACH	..	SER. Wb (35 t). Cr (4 t) and Cr (10 t).
49.4	..	Road overbridge. Tunnel.	c. 300 m.
55.3	LINDACH	..	Passenger station.
57.3	..		Line turns E.
			Line turns S.
58.3	ZWINGENBERG		SER. Wb (25 t).
58.7	..	Bridge over stream.	Line turns SE.
59.1	..		
61.6	..	Bridge over stream.	
61.9	NECKARGERSBACH		SER. Wb (25 t).
63.9	..	Tunnel.	c. 950 m.
65.4	BINAU	..	SER.
68.9	NECKARETZ	..	SER. Wb (35 t). Cr (6 t). ES. Tbl. W.
69.7	..		J (facing) right, with (i) ST s.o. line to Meckenheim (37.1 km.) and (ii) ST s.o. line to Jagstfeld (17.5 km.).
70.0	..	Bridge over stream.	
71.6	MOSBACH	..	SER. Wb (40 t). Cr (4 t).
			I with 1 m. gauge light railway to Mudau (27.6 km.).
71.9	..	Road overbridge.	
72.2	..	Bridge over stream.	
74.2	..	Railway overbridge.	Line passes under light railway to Mudau.
74.5	..	Bridge over stream.	
75.2	NECKARBURKEN	..	Restricted goods facilities.
76.4	..	Bridge over stream.	
77.4	DALLAU	..	SER. Wb (25 t). Cr (4 t).
78.5	..	Bridge over stream.	
78.8	..	Tunnel.	c. 450 m.
79.3	..		Line crosses road, and turns SE.
79.6	..		Line crosses stream.
80.8	AUFBACH	..	SER. Wb (25 t).
			Line curves NE.
81.1	..		Line turns E.
81.2	..	Tunnel.	c. 600 m.
81.5	..		

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
85.5	..	..	J (trailing) right, with ST branch line from Müllighheim (8.7 km. long).
85.6	..	Bridge over stream and road.	
85.7	OBERSCHLEIFEN	..	Joint station with Oberschleifens-Müllighheim branch railway. SER. Wb (25 t). Cr (2 t). Line turns N.
87.8	LICHOLZHEIM	..	SER. Wb (40 t). Cr (2 t). Line crosses road.
88.0	..	..	Line turns SE.
88.4	..	..	Line turns N.
89.4	..	..	Line turns E.
90.6	..	Bridge over road and stream.	
91.7	..	Bridge over road.	
91.9	..	..	J (trailing) left, with ST branch line from Miltenberg (45 km.) Line turns S.
92.3	SEGRACH	..	SER. Wb (35 t). Cr (6 t). Line turns SE.
92.8	..	Bridge over road and river.	c. 250 m.
93.7	..	Tunnel.	c. 150 m.
94.8	..	Tunnel.	
95.0	..	Bridge over river.	
96.8	ADELHEIM (NORD)	..	SER. Wb (25 t). Cr (2 t). Line turns E.
97.8	..	Bridge over river.	
98.0	..	Tunnel.	c. 150 m.
98.7	..	..	J (trailing) right, with DT s.o. line from Heilbronn (Route 99).
101.6	OSTERBIBIRCH	..	SER. Wb (36 t). Cr (4 t).
179.6	WÜRZBURG	..	Line continues to Würzburg as Route 99.

ROUTE 97A

NECKARGEMÜND-MECKESHEIM-BAD FRIEDRICHSHALL-JAGSTFELD

General Description

Although, apart from the stretch from Neckargemünd to Meckesheim which is DT, the line is ST, this route provides the most direct service between Heidelberg and Heilbronn for traffic from the Mannheim area to Stuttgart and South Germany.

The country through which the line passes is rather hilly and, to avoid heavy gradients or the alternative of expensive engineering works, the route follows the course of the R. Elsenz to Steinfurt, where it turns E after crossing the Elsenz, following the valley of the Isen to its source and after climbing the summit between the valleys of the Elsenz and the Neckar descends along the Mühl to its confluence with the Neckar, which it crosses, and joins the main line (Route 99), at Jagstfeld.

Several minor bridges are entailed in crossing tributaries of the Elsenz and that river itself, but the most important bridge is that over the Neckar at 45.7 km.

The principal junctions are at Neckargemünd with Route 97, at Meckesheim (10.5 km.) with the ST line to Neckarelz which involves several tunnels, at Steinfurt with the ST line to Eppingen (Route 74), and at Jagstfeld with the main line Heilbronn-Würzburg (Route 99).

General Details

1. GAGES: 1433 mm (4 ft. 8 1/2 in.). Standard.
2. TONNAGE: 25 t (25 metric tons).

3. TRACK:

Neckargemünd-Meckesheim, double.
Meckesheim-Bad Friedrichshall-Jagstfeld, single.

4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.

5. MAXIMUM GRADIENT:

No details but a general tendency to rise to Babstadt.

6. MINIMUM RADII OF CURVES:

No details but will probably be restrictive to speed and wheelbase.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

7 km. (4 1/4 miles).

9. ENGINE SHEDS:

Heidelberg (Route 97).

Heilbronn (Route 99).

11. WATERING FACILITIES:

No other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Junctions at Neckargemünd, Meckesheim, Steinfurt and Jagstfeld.

(b) Bridges over R. Elsenz at 3.6 km. and 2.4 km., and over R. Neckar at 45.7 km.

13. CAPACITY:

Trains per day Net tonnage
each way per day
15 300

NECKARGEMÜND TO BAD FRIEDRICHSHALL-JÄSTFELD

51

Distance from Neckargemünd

Km.	Stations	Engineering works	Details and facilities
0.0	MANHEIM	Route 97.	
0.7	HEIDELBERG	Route 97.	
0.8	NECKARGEMÜND	..	SER. Wb (35 t). Cr (5 t). Line crosses minor road.
0.4	..	..	J (facing) left with ST s.o. line to Osterburken (Route 97).
2.6	WALDHEIMBACH	..	Passenger station.
3.1	..	Bridge or culvert over stream.	Line crosses minor road.
4.5	BAMMENTAL	.. .. 2 Ditto	SER. Wb (25 t). Line crosses 2 minor roads. Line crosses minor road.
5.4	REILHEIM	..	Passenger station. Line crosses minor road.
5.6	..	Bridge over R. Elsenz.	
7.8	MAUER	..	ER. Wb (25 t). Line crosses 2 roads.
8.8	..	Bridge or culvert over stream.	
10.0	MECKENHEIM	..	SER. Wb (35 t). J (facing) right with ST s.o. line to Wimsloch-Walldorf on the DT s.o. line Heidelberg-Karlsruhe.
		Ditto	Line crosses road.
10.5	..	..	J (facing) left with ST s.o. line to Neckarelz (32.1 m.) on the Mannheim-Osterburken line (Route 97). Line crosses main road to Sinheim.
11.6	..	Ditto	
12.8	FÜZENHAUSEN	..	SR. Wb (25 t). Line crosses 2 minor roads.
14.3	..	Ditto	Line crosses minor road.
16.1	HOFFENHEIM	..	SER. Wb (25 t). Line crosses minor road.
16.4 17.2 17.9 18.6	..	4 bridges or culverts over over streams.	Line crosses main road.
20.0	SINHEIM (ELSENZ)	..	SER. Wb (40 t). Cr (2 t). Line crosses minor road.
21.2 21.4	..	2 bridges or culverts over streams.	Line crosses 3 minor roads.
23.0	STEINSPURT	..	SER. Wb (40 t).
23.2 23.7	..	Bridge over R. Elsenz.	J (facing) right with ST s.o. line to Eppingen (12.9 km.) on the DT s.o. line Karlsruhe-Heil- bronn.
24.0	..	Culvert or bridge over stream.	Line crosses main road. Line crosses minor road.
29.3	..	Ditto	Line crosses minor road.
30.0	GROMBACH	..	SER. Wb (25 t). Line crosses 2 minor roads.

Km.	Stations	Engineering works	Details and facilities
34.9	BARTANT	..	4PR. Wb (25 t). Line crosses minor road. Line crosses main road.
35.7	..	..	..
37.4	..	Bridge or culvert over stream.	..
37.9	BAD RAPPENAU	..	SER. Wb (35 t). Line crosses a minor road.
40.1	..	..	..
40.6	..	a Ditto	Line crosses a minor road. Line curves sharply right. Line crosses minor road.
..	..	Ditto	Line crosses minor road.
43.8	BAD WIMPFEN	..	SER. Wb (40 t). Line crosses a minor road.
45.7	..	Bridge over R. Neckar. Road overbridge.	J (trailing) left with: (1) DT main line from Osterburken (Route 99). (2) ST line from Neckarelz.
46.4	BAD FRIEDRICHSHALL- JAGTFELD (WURTT.)	..	SER. Wb (35 t). Cr (6 t). Line continues S to Heilbronn as Route 99.
57.6	HEILBRONN	Route 99.	..
86.3	BERTHEIM	Routes 99 and 77.	..
110.3	STUTTGART	Routes 99, 77, 75.	..

ROUTE 98

BRUCHSAL-HEIDELBERG

General Description

Connecting with Route 67a at Bruchsal and Route 97 at Heidelberg, this forms part of the main line from Karlsruhe and the South to Würzburg and North-East Germany.

The route runs through the low-lying country of the Rhine valley, and gradients are not severe.

At Bruchsal, in addition to the connecting line to Karlsruhe (Route 67a), junctions exist with the main line running W to E from Saarbrücken, connecting at Mühlacker with Route 75 (Karlsruhe to Stuttgart and München), whilst at Heidelberg, junctions also give connections E to Mannheim for Kaiserslautern, and to the main S-N lines to Darmstadt and Frankfurt, and Worms and Mainz. These two important railway centres (Bruchsal and Heidelberg) present the most vulnerable points of the route, but in addition, whilst major engineering works are not considerable, numerous small bridges over tributaries of the Rhine increase vulnerability.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 33.1 km. (20½ miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.

5. MAXIMUM GRADIENT: 3 per mille (1 in 200).
6. MINIMUM RADIUS OF CURVES: 450 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 5.4 km. (3½ miles).
9. ENGINE SHEDS:
(Karlsruhe.) Heidelberg.
Bruchsal.
10. MARSHALLING FACILITIES:
(Karlsruhe.) Heidelberg.
Bruchsal.
11. VULNERABLE POINTS: Marked with asterisk in text.
(a) Locomotive and marshalling facilities at Bruchsal and Heidelberg.
(b) Junctions at Bruchsal and Heidelberg.
(c) Bridges—several small rivers and streams are crossed en route, none of which however are of any great width.
12. CAPACITY:

Trains per day each way	Net train load tons military stores
72	300

Distance from Bruchsal

Km.	Stations	Engineering works	Details and facilities
131.3	SAARGEMÜND	Routes 70 and 68.	ES. Tbl. W.
24.9	GERMESBACH	Route 70.	SER. Wb (35 t). Cr (6 t). For details, see Route 70.
21.3	KARLSRUHE	Route 67a.	Line runs NE for straight stretch, c. 7-6 km. long.
0	BRUCHSAL	..	Line crosses main road.
0.4	..	..	J (facing) left, with DT s.o. line to Graben-Neudorf (Route 70).
1.4	..	..	Line crosses main road.
2.0	..	..	J (facing) right, with ST s.o. line to Ubstadt (c. 2-3 km. long).
2.7	..	..	Line crosses small stream.
3.0	..	..	Ditto
3.4	..	..	..
4.8	..	Bridge or culvert over stream.	..
5.3	..	..	Line crosses main road.
5.4	UBSTADT-WEIER	..	SER. Wb (25 t).
6.1	..	Ditto	..
6.8	..	Ditto	..
6.9	..	..	Line crosses small stream.
7.3	..	Bridge over river.	..
7.4	..	..	Line curves N, and continues in same direction to outskirts of Heidelberg.
9.3	LANGENBRÜCKEN	..	SER. Wb (30 t). Cr (4 t).
11.4	..	..	Line crosses main road.
11.5	MINGOLSHHEIM-KRONAU	..	SER. Wb (40 t). Cr (6 t).
12.2	..	Bridge or culvert over stream.	..
13.3	..	Ditto	..
14.2	ROT-MALCH	..	SER. Wb (40 t).
14.4	..	Bridge over main road and stream.	..
16.9	..	Bridge or culvert over stream.	..
19.6	WIESLOCH-WALLDORF	Bridge over two streams.	SER. Wb (35 t). Cr (6 t). J with ST s.o. line to Wiesloch and Meckesheim (13.6 km.); also Waldangelock (16.3 km.). I—with narrow-gauge line to Walldorf.
20.2	..	Ditto	Line crosses main road.
21.6	..	Bridge over stream.	..
21.7	WALLDORF	..	Passenger station.
23.1	ST. ILGEN	..	SER. Wb (25 t). Cr (6 t).
23.5	..	Ditto	..
26.3	..	Ditto	..
27.1	LEIMEN	..	Passenger station. Line crosses minor road.
29.5	HEINFELBERG-KIRCHHEIM	..	SER. Wb (40 t). Cr (6 t). I with DE narrow-gauge line running S. and then E. to factory, c. 4 km. long.
30.6	..	..	J (facing) right, with DT s.o. line to goods station and Wieslingen station (Route 70).

Km.	Stations	Engineering works	Details and facilities
*30.8	..	..	J (facing) left, with ST s.o. line to Schwetzingen.
31.4	..	..	Line curves W.
*31.6	..	..	J (trailing) right, with ST s.o. line from Mannheim (Route 97).
33.1	HEIDELBERG Hbf.	..	SER. Wb (80 t). Cr (20 t). MY. ES. Thl. W. For location diagram of area, see Plan 48. Line continues E as Route 97.
(194.5	WÜRZBURG)	Routes 97 and 99.	

ROUTE 99

HEILBRONN-OSTERBURKEN-LAUDA-WÜRZBURG

General Description

Together with Routes 77 and 75, this route forms the main line from Stuttgart to Würzburg and North-East Germany. The line follows an almost continuously winding course from Heilbronn, following in turn the valleys of the rivers Neckar, Jagst, Seckach, Umpfer, Tauber and Moos.

After leaving the Neckar valley at Jagstfeld, it ascends gradually to 200 m. at Zütilingen, and 300 m. at Osterburken, where it joins the main line from Mannheim (Route 97).

The hillside between the end of the Seckach and beginning of the Umpfer valley is pierced by a tunnel (at 64.0 km.). At the end of the Umpfer valley the line descends to 200 m. and enters the wider Tauber valley, leaving it at Gerlachsheim and climbing again to 300 m. along the winding Moos valley. From Zimmern (at 94.5 km.) the ground is more open, though still at the 300 m. level. A second tunnel cuts through the hillside at 99.1 km.

At 121.9 km. (Heidingsheim West) there is a J with the Würzburg-Ansbach line (Route 86), from which point the line descends to the R. Main and crosses it by a bridge c. 100 m. long. At 126.1 km. there is a J with the Würzburg-Bamberg line (Route 100).

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 127.3 km. (79 miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.

Distance from Heilbronn

Km.	Stations	Engineering works	Details and facilities
54.0	STUTTGART	Routes 75 and 77.	
215.3	SAARBRÜCKEN	Routes 74, 70, 66.	
(115.0)	(BRIT. S.)	Route 74.	
*0	HEILBRONN Hbf.	..	MY. Capacity 2,000 wagons per 24 hours. FS. Thl. W. SER. Wb (80 t). Cr (20 t). J with DF s.o. lines running E to Gerlachsheim (Route 70), S. to Heilbronn (Route 75), and W. to Bamberg (Route 100).

5. MAXIMUM GRADIENT: 13 per mille (1 in 66).
6. MINIMUM RADIUS OF CURVES: 312 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 7.1 km. (4½ miles).
9. ENGINE SEEDS: Heilbronn. Würzburg.
Lauda.
10. MARSHALLING FACILITIES: Capacity per 24 hours
Heilbronn 2,000 wagons
Würzburg 2,000 wagons
11. WATERING FACILITIES: Heilbronn. Lauda. Würzburg.
No other details.
12. VULNERABLE POINTS: Marked with asterisk in text.
(a) Marshalling and locomotive facilities given in 9 and 10 above.
(b) Junctions at Heilbronn, Jagstfeld, Osterburken, Königshofen, Lauda, Heidingsheim West and Würzburg.
(c) Bridges at 85.7, 99.6 and 122.8 km.
(d) Tunnels at 64.0 and 99.1 km.
13. CAPACITY: Trains per day each way Net train load tons military stores
60-72 500

Km.	Stations	Engineering works	Details and facilities
0.5	..	Bridge over R. Neckar.	Line crosses several minor roads, and runs in wide curve to Neckarsölm.
0.2	..	Bridge over R. Neckar.	
0.2	..	..	J (facing) right, with DT a.o. line to Crailsheim (Route 79).
1.3	HEILBRONN-SÜLMERTON	..	Passenger station.
1.5	..	..	J (facing) left, with ST loop line to industrial establishments rejoining main line at 4.4 km.
3.2	..	..	Line crosses main road.
4.4	..	..	J (trailing) left, with loop line, avoiding station.
5.6	NECKARSÖLM	..	SER. Wb (32 t). Cr (1.5 t). Line crosses several minor roads, and curves NE.
6.4	..	Bridge over R. Sölm.	
7.3	..	..	Line curves NW.
7.7	..	..	Line runs beside main road.
8.6	..	Bridge or culvert over stream.	
9.4	BAD FRIEDRICHSHALL-KOCHENDORF	..	SER. Wb (32 t). Cr (1.8 t). Line leaves main road.
10.0	..	Bridge over river.	
10.5	..	Bridge or culvert over stream.	
10.7	..	..	J (facing) left, with ST a.o. line to Steinsfurt (22.4 km.) Meckesheim (36.4 km.), Neckargemünd (46.4 km.), and Heidelberg (56.1 km.).
10.9	..	..	J (trailing) right, with ST a.o. DE local line from Ohrnberg (c. 22.6 km. long).
11.2	BAD FRIEDRICHSHALL-JAGSTFELD	..	SER. Wb (35 t). Cr (2 t).
11.7	..	..	J (facing) left, with ST a.o. line to Neckarelz (17.3 km.). Line curves sharply NE and follows valley of R. Jagst.
14.6	DUTTENBERG-OBERORNESHEIM	..	Passenger station.
14.9	..	..	Line turns N.
16.3	UNTERORNESHEIM	..	SER. Wb (32 t). Cr (1.4 t).
17.1	..	..	Line curves NE, and runs alongside river to Herbolzheim.
21.1	HERBOLZHEIM (JAGST)	..	Restricted goods facilities. Line crosses main road and stream.
21.6	..	..	Line re-crosses main road.
22.0	..	..	Line turns E.
22.3	..	..	Line re-crosses main road.
22.6	NEUDENAU	..	SER. Wb (40 t). Cr. (1.8 t). Line re-crosses main road.
23.0	..	..	Line curves SE.
24.6	..	..	Line curves N.
26.2	SIGLINGEN	..	SER. Wb (32 t). Cr. (1.8 t). Line curves E. and then S.
27.7	..	..	Line curves E. and then N.
28.4	..	..	Line crosses stream.
28.6	ZÜTTINGEN	..	SER. Wb (40 t). Cr. (1.8 t). Line turns NE.
29.4	..	Bridge or culvert over stream.	
30.0	..	..	Line curves E.
30.1	..	..	Line crosses main road and turns N E.
30.9	..	..

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
31.1	..	Bridges over R. Jagst.	Line crosses minor road.
31.5	Line reaches 200 m. contour-line, and turns N.
31.8	Line crosses stream.
32.4	J (facing) right with short ST connection to station for light railway line to Dorzbach, length 38.6 km., gauge 0.75 m.
33.3	MOCHMÜHL	..	SER. Wb (40 t). Cr. (1.8 t). I with 0.75 m. gauge line to Dorzbach, distance 38.6 km. Line follows valley of R. Seckach to Adelsheim, and ascends gradually to Hirschlanden.
34.4	..	Bridge or culvert over stream.	Line curves E.
35.0	Line curves N.
35.9	Line curves W.
37.2	Line curves N.
37.9
38.7	ROICHHEIM	..	SER. Wb (32 t). Cr (5 t). Line turns NE.
39.2	..	Ditto	..
39.7	..	Ditto	..
40.7	Line crosses main road.
40.8
42.3	SENNFELD	..	SER. Wb (32 t). Cr (1.75 t). Line curves E and then N.
43.7	..	Ditto	..
45.0	..	Ditto	Line crosses minor road.
45.5
45.6	ADELSHEIM OPT	..	SER. Wb (40 t). Cr (5 t).
45.9	..	Ditto	Line turns NE.
46.8	..	Ditto	..
47.9	J (trailing) left, with DT s.o. line from Mannheim (Route 97).
48.2
49.3	OSTERBURKEN	..	SER. Wb (36 t). Cr (4 t). Line crosses main road.
49.7
50.6	..	Ditto	..
52.2	..	Ditto	..
53.0	..	Ditto	..
53.4	..	Ditto	..
53.6	Line reaches 300 m. contour line.
54.0	ROSENBERG (BADEN)	..	SER. Wb (36 t). Cr (2 t). Line crosses main road.
55.0	..	Bridge or culvert over stream	..
56.2	..	Ditto	..
57.0	HIRSCHLANDEN	..	SER. Wb (40 t). Line crosses minor road.
57.4	..	Ditto	..
58.3	..	Ditto	..
59.9	..	Ditto	..
60.2	Line crosses main road.
61.1	ERNIGHEIM	..	SER. Wb (40 t). Cr (2 t).
63.1	..	Ditto	..
64.0	..	Tunnel	.. 400 m.
64.8	Line curves SE and enters valley of R. Umpfer, which it follows to Königshofen.
65.1	..	Bridge over stream.	Line curves S.
66.3
68.1	ULFINGEN	..	Restricted goods facilities.
68.5	Line curves SE.
70.1	Line curves E.

Km.	Stations	Engineering works	Details and facilities
72.1	BOXBERG-WACHINGEN	..	SER. Wb (25 t). Cr (2 t). Line curves ENE.
73.4	..	Bridge or culvert over stream.	
73.9	SCHWEIGERN (BADEN)	..	SER. Wb (26 t). Line curves NE, and runs close to R. Umpfer.
74.4	..	..
77.1	UNTERSCHÜFF	..	SER. Wb (26 t). Cr. (4 t).
77.4	..	Ditto	
79.0	SACHSENFLUR	Bridge over stream and main road.	Restricted goods facilities.
80.4	..	Bridge or culvert over stream.	
80.8	..	Ditto	
81.2	..	..	Line curves NW and enters wider valley of R. Tauber, which it follows to Lauda.
81.3	..	..	Line crosses main road.
81.4	..	Bridge or culvert over stream.	
*81.5	..	..	J (trailing) right with ST s.o. line from Weikersheim and Crailsheim (66.6 km.).
81.7	KÖNIGSHOFEN (BADEN)	..	SER. Wb (35 t). Cr. (4 t).
82.9	..	..	Line descends to 200 m. contour line.
*84.1	LAUDA	..	ES. Tbl. W. SER. Wb (35 t).
84.6	..	Ditto	
85.3	..	..	J (facing) left, with ST s.o. line to Wertheim (31.4 km.).
85.4	..	..	Line curves E, and follows valley of R. Moos to Geroldshausen.
*85.7	..	Bridge over R. Tauber.	
86.2	..	..	Line crosses main road.
86.4	GERLACHSHEIM	..	SR.
87.4	..	..	Line ascends to 300 m. contour line.
88.0	..	..	Line curves N, following river closely in narrow valley.
89.7	..	..	Line curves E.
91.0	GRÜNSFELD	..	SER. Wb (40 t).
91.5	..	..	Line curves SE.
94.5	ZIMMERN	..	SER only 7 m. long. Wb (25 t). Line curves NE.
94.7	..	..	Line crosses small stream.
96.0	..	Bridge or culvert over stream.	
97.8	..	..	Line curves E.
98.7	..	..	Line curves N.
99.0	..	Bridge or culvert over stream (Innsinger).	
*99.1	..	Tunnel	c. 300 m. long.
*99.6	..	Bridge over R. Moos.	
99.7	WITTICHAUSEN	..	SER. Wb (40 t). Line curves NE.
*100.4	..	Bridge over R. Moos.	
100.7	..	..	Line curves N.
*101.7	..	Bridge over R. Moos and R. Sulzdorfer.	Line crosses to R. bank of R. Moos.
101.8	GAUDENSTADTBRUNN	..	Restricted goods facilities.
102.5	..	Bridge or culvert over stream.	
103.6	..	Bridge or culvert over stream (R. Moos).	

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
105.3	KIRCHHEIM (Bei WÜRZBURG)	..	SER. Wb (40 t). Cr (15 t).
106.6	..	..	Line curves NE.
106.7	..	Bridge over R. Moos.	..
107.2	..	Bridge over R. Moos.	Line curves SE.
107.9	..	Bridge over R. Moos.	..
108.0	MOOS	..	SR.
108.4	..	..	Line gradually curves N.
109.9	..	Bridge over R. Moos.	..
111.3	GEROLDSHAUSEN	..	SER. Wb (15 t).
111.9	..	..	Line curves NE.
114.3	..	..	Line curves NW and enters valley of R. Mithl. Falling gradient.
116.7	REICHENBERG (Bei WÜRZBURG)	..	SER. Wb (26 t).
117.2	..	Bridge or culvert over stream.	..
117.7	..	..	Line curves NE.
117.8	..	Ditto	..
119.4	..	Ditto	..
120.2	..	..	Line descends to 200 m. contour line.
121.3	..	..	Line curves N.
121.7	HEIDINGSFELD WEST	..	SER. Wb (40 t). Cr. (2.5 t).
*121.9	..	..	Line curves NNW.
122.4	..	..	J (trailing) right, with DT s.o. line from Ansbach (Route 86).
*122.8	..	..	Line curves NNE, and crosses main main road.
123.2	..	Bridge over R. Main.	c. 100 m. long.
124.6	WÜRZBURG SÜD	..	Line crosses road, and curves N.
125.4	..	..	Passenger station.
*125.1	..	..	Line crosses several local roads, curving NNE.
126.2	..	..	Line crosses main road.
126.3	..	..	J (trailing) right with DT s.o. line to Nürnberg (Route 90) and Schweinfurt (Route 100).
127.3	WÜRZBURG Hbf.	..	Line curves W.
		Bridge over stream (Pleischach).	SER. Wb (40 t). Cr. (15 t).
			3 ES (RH type), repair shops attached.
			3 Tubs.
			W.
			MY at Würzburg-Zell, Route 86, capacity 2,000 wagons per 24 hours.
			For location diagram of Würzburg, see Plan No. 42.

WÜRZBURG TO BAMBERG

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ROUTE 100

WÜRZBURG-SCHWEINFURT-BAMBERG

General Description

The line runs common with Route 90 to the junction at 92 km., where it branches N through the valley of the R. Main to Schweinfurt, whence it closely follows the right bank of the river to Bamberg, junction for the DT electric line Berlin-Nürnberg (Route 101).

Several minor tributaries of the Main are crossed, but the only major bridge is that over the Main at 96.4 km.

The principal junctions are at Würzburg, with the main lines to Nürnberg (Route 90), Ansbach (Route 86), Heidelberg and Stuttgart (Route 99), at Waigolshausen with the branch line from Gemünden (Route 96) which provides an alternative to Routes 86 and 100, at Schweinfurt with the main line from Meiningen, Leipzig and Berlin (Route 100a), and at Bamberg with Route 101.

General Details

1. GAUGE: 1435 mm. (4 ft 8½ in.). Standard.
2. LENGTH: 100.2 km. (62½ miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 7 per mille (1 in 140).

6. MINIMUM RADIUS OF CURVES: 330 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:
9.4 km. (5½ miles).

9. ENGINE SHEDS:
Würzburg. Schweinfurt.

10. MARSHALLING FACILITIES:
Würzburg. Schweinfurt.

11. WATERING FACILITIES:
Würzburg. Schweinfurt.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Marshalling and locomotive facilities at Würzburg and Schweinfurt.

(b) Junctions at Würzburg, Waigolshausen, Schweinfurt and Bamberg.

(c) Bridges en route—the principal being that over the Main at 96.4 km.

13. CAPACITY:

Trains per day each way	Net train load tons military stores
72	500

Distances from Würzburg

Km.	Stations	Engineering works	Details and facilities
135.5	FRANKFURT Hbf.		
131.1	FRANKFURT S.		
89.3	ASCHAFFENBURG	Route 86	
37.0	GEMÜNDEN		
0.	WÜRZBURG		SER. Wb (40 t). Cr (15 t). MY (capacity 2,000 wagons per 24 hours at Würzburg Zell. 3 ES (RH). 3 Tbl. W. For location diagram, see Plan 42. Line runs E.
1.1	..	Bridge or culvert over stream.	
1.2	..		J (facing) right, with DT s.o. line to Ansbach and Treuchtlingen (Route 86).
2.3	ARTILERIEKASERNE		Passenger halt.
4.5	..		Line crosses main road.
4.7	..	Ditto	
5.4	..	Ditto	
6.6	..		Line curves N.
7.1	..	Ditto	
7.9	ROTTENDORF		SER. Wb (40 t). Line curves NE.
9.0	..		J (facing) right, with DT s.o. line to Nürnberg (Route 90).
9.2	..		Line curves NNE.
11.0	..		Line curves N.
15.0	..		
17.3	SELLENSTADT		J (facing) right, with ST DE. s.o. s.o. branch line to Volkach (distance 10.6 km.). Line curves NW
19.3	..		
20.3	..	Bridge over R. Main.	

Km.	Stations	Engineering works	Details and facilities
22.0	..	..	Line gradually curves NE.
22.8	BRUNTHUM	..	SER. Wb (32 t).
23.9	..	Bridge or culvert over stream.	..
26.3	..	..	Line curves NW.
27.8	..	..	Line curves N and then NE.
28.3	EMLENEN	..	SER. Wb (32 t).
30.8	..	..	J (trailing) left, with ST s.o. line from Gemünden (distance 39.8 km.).
31.3	..	Bridge or culvert over stream (Gassig)	..
31.9	WAGOLIMAUEN	..	SER. Wb (40 t).
32.2	..	..	Line curves E and then NE.
34.0	..	..	Line gradually curves N.
36.5	BERGMZINFELD	..	SER. Wb (32 t).
36.7	..	..	Line crosses main road.
37.3	..	..	Line curves NE.®
40.9	..	..	Line curves ENE.
42.7	..	..	J (trailing) left, with DT s.o. line from Ebenhausen (Route 1002).
42.8	..	..	Line crosses main road.
43.3	SCHWEINFURT Hbf.	..	SER. Wb (40 t). Cr (8 t). ES. Tbl. W. Passenger Station. 2 island platforms 300-400 m. 6 through lines. Shunt Yard. W of station. c. 8 LS 500-800 m. long. Loco Depot. W of SY. 2 ES (RH), holding capacity c. 50 locos. 2 Tbl (25 m). W. Storage Sidings. S of loco depot. c. 6 DES (c. 470 m.). Line crosses main road. J (facing) right, with ST. s.o. line to Kitzingen (distance 49.9 km). Line turns NE, keeping close to R. Main
45.2	..	Bridge or culvert over river.	..
45.8	..	..	SER. Wb (40 t). Cr (5 t).
46.4	..	Bridge or culvert over stream (Hollenbach)	..
47.2	..	..	Line takes wide curve E and then SE, following course of R. Main to Hassfurt.
49.0	MAINBERG	..	Passenger station.
49.7	..	Bridge or culvert over stream (Schenkels Leite).	..
50.6	..	Bridge or culvert over stream (Mühlbach).	..
50.8	SCHONUNGEN	..	SER. Wb (31 t).
53.2	..	Bridge or culvert over stream.	..
53.7	..	..	Line curves E.
56.4	GÄRHEIM	..	SER. Wb (31 t).
58.4	..	Ditto	..
58.9	..	Bridge or culvert over stream	..
59.4	..	Ditto	..
60.3	UNTERTIEREN	..	Passenger station.
61.0	..	Ditto	..
62.0	..	Ditto	..

WÜRZBURG TO BAMBERG

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Km.	Stations	Engineering works	Details and facilities
62.3	OBERTHERRS	..	SER. Wb (32 t). Line curves SE.
65.3 65.8	..	Bridge or culvert over stream.	Line crosses main road.
67.6	HANFURT	..	SER. Wb (40 t). Line turns SE, and begins straight stretch c. 17 km. long.
67.9 68.2	..	..	Line crosses main road. J (facing) left, with ST s.o. line to Hofheim (distance 15.5 km.).
68.6 74.5	..	Ditto Ditto	
74.7 76.2	ZELL	.. Ditto	SER. Wb (32 t). Cr (4 t).
80.3 80.5 80.8 81.3 84.4	ESSELBACH-ELTMANN	.. Ditto Ditto Ditto	SER. Wb (40 t). Cr (15 t). Line crosses main road.
84.5	STETTIFELD	..	Restricted goods facilities. Line turns SE.
87.5 87.9 88.1	STAFFELBACH	.. Ditto	SER. Line curves SSE.
92.9	OBERMAID	Ditto	Wb (31 t). Line turns E. Line curves SE.
93.7 96.4 97.6 98.9	..	Bridge over R. Main.	Line crosses main road. J (trailing) left, with DT s.o. line from Hochstadt-Marktzeuln (Route 101). J (trailing) right, with ST s.o. line from sidings. J (trailing) left, with ST s.o. line from Schesslitz (distance 13.7 km.).
99.0 99.5	..	..	Line crosses main road.
99.6 99.9	..	Bridge or culvert over stream.	
*100.2	BAMBERG	..	SER. Wb (48 t). Cr (15 t). J for DT electrified line, Nürnberg to Berlin, see Route 101.

RAILWAYS

ROUTE 100A

MEININGEN-EBENHAUSEN-SCHWEINFURT

General Description

Forming part of the main line from Berlin via Leipzig and Erfurt to Nürnberg, this route runs in a southerly direction from Meiningen, junction also for the ST line Eisenach-Meiningen-Coburg (Route 101a), to connect with DT main line Würzburg-Schweinfurt-Bamberg-Nürnberg (Routes 100 and 101).

The line follows a winding course through a succession of valleys for c. 53 km., after which it runs cross-country to Poppenhausen (c. 68 km.). The remainder of the journey is down the valley of the R. Werra, until the line curves E to enter the valley of R. Main at Schweinfurt.

Heavy gradients may be expected, with a general tendency to fall towards Schweinfurt.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 77.9 km. (48½ miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 11.4 per mille (1 in 88).
6. MINIMUM RADIUS OF CURVES: 300 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS: 10.1 km. (6¼ miles).

9. ENGINE SHEDS:

Meiningen.

Schweinfurt.

10. MARSHALLING FACILITIES: Schweinfurt.

11. WATERING FACILITIES:

Meiningen.

Schweinfurt.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Marshalling and locomotive facilities at Meiningen and Schweinfurt.

(b) Junctions at Meiningen, Ebenhausen and Schweinfurt.

(c) Workshops at Meiningen.

(d) Bridges at 39.7 km., over R. Saale, at 75.5 km., over R. Werra.

13. CAPACITY:

Trains per day
each way
48

Net train load tons
military stores
300-400

Distance from Meiningen

Km.	Stations	Engineering works	Details and facilities
*0	MEININGEN	..	SER. Wb (36 t). Cr (20 t). RpS. ES. Tbl. W. Line runs S, following valley of R. Werra. Line curves SE.
3.3	J (facing) left, with DT s.o. line to Coburg (Route 101 (a)).
*4.6	J (trailing) left, with DT s.o. line from Erfurt.
4.9	..	Bridge over R. Werra.	Line turns S, following valley of R. Juchsen.
*5.8	Line crosses main road.
6.2	
6.7	..	Bridge over stream (Bauer).	
7.4	RITSCHENHAUSEN	..	SER. Wb (40 t).
7.8	Line curves E.
8.5	Line gradually curves S to enter narrow valley of R. Bibra.
10.1	Line crosses minor road.
14.7	RENTWERTSHAUSEN	..	SER. Wb (32t).
15.1	..	Road overbridge.	J with ST s.o. DE line to Römhild (10.7 km.).
15.3	Line curves NW
15.9	Line crosses road.
16.3	Line turns W.
16.8	Line crosses road.
19.6	Line curves SW and then W, following valley of stream (Grüne).
20	Mühlstedt	..	Restricted goods facilities.
21.1	Line curves S, following valley of small R. Mahl.
21.3	..	Bridge or culvert over stream.	
21.4	Line turns SW and leaves valley.
21.4	J (trailing) right, with ST co. DE line to Hildingen (11.4 km.)
21.5	Line crosses road.

MEININGEN TO SCHWEINFURT

69

Km.	Stations	Engineering works	Details and facilities
25.8	MELLRICHTADT		SER. Wb (40 t).
26.2	..	Road overbridge.	
27.8	..	Ditto	
28.8	OBERRAU	..	Restricted goods facilities.
31.8	UNILESEN		SER. Wb (32 t).
32.1	..	Ditto	
32.5	..	Bridge or culvert over stream.	
33.0	..	Road overbridge.	Line follows valley of R. Streu.
35.3	HEUSTREU	..	SER. Wb (32 t).
35.8	..	..	Line gradually curves SW and enters valley of R. Saale.
37.3	..	..	J (trailing) left, with ST s.o. DE line from Königshofen (23.2 km.)
38.8	..	Road overbridge.	
39.1	BAD NEUSTADT	..	SER. Wb (40 t).
			J (trailing) right, with ST s.o. DE line from Bischofsheim (Rhön), 18.9 km.
40.7	..	Bridge over R. Saale.	
40.2	..	Bridge or culvert over stream.	
40.4	..	Ditto	
40.7	..	Road overbridge.	
42.2	..	Ditto	
43.6	NIEDERLAUER	..	SER. Wb (32 t).
44.2	..	..	Line crosses main road and turns S.
45.7	..	Bridge or culvert over stream.	Line enters valley of small R. Lauer.
48.2	..	..	Line crosses minor road and curves SE.
49.0	MÜNNERSTADT	..	SER. Wb (32 t).
50.0	..	..	Line crosses minor road and curves S.
51.1	..	Bridge or culvert over stream.	
52.1	..	Ditto	
53.0	..	..	Line leaves valley and runs across country to Poppenhausen.
56.6	..	..	J (trailing) left, with ST s.o. DE line from Stadtlauringen (16.9 km.). Axle-load = 12.5 t.
57.8	..	Road overbridge.	
58.6	ROTTERSHAUSEN	..	SER. Wb (32 t).
60.3	..	..	Line crosses minor road.
62.0	..	Road overbridge.	
63.0	..	..	Line crosses main road.
63.7	..	..	J (trailing) right, with ST s.o. DE line from Bad Kissingen (9.4 km.).
64.2	EBENHAUSEN	..	SER. Wb (32 t).
67.8	POPPENHAUSEN	..	SER.
68.3	..	..	Line curves S and follows valley of R. Werra.
68.8	..	Bridge or culvert over stream.	
69.3	..	..	Line crosses minor road.
70.0	..	..	Line crosses main road.
71.4	OBERRAUN	..	SER. Wb (40 t).
74.3	..	Road overbridge.	
75.3	..	Bridge over R. Werra.	
76.6	..	..	Line curves E.
77.3	..	..	J (trailing) right, with DT s.o. line from Würzburg (8.22 km.).
			Line crosses main road.

Km.	Stations	Engineering works	Details and facilities
77.9	SCHWENFURT Hbf.	..	<p>Passenger Station: 2 island platforms 300-400 m. long. 6 through tracks.</p> <p>Shunt Yard: West of station, c. 8 LS 1000-2000 m. long.</p> <p>Loco. Depot: W of SY: 2 ES (RH), holding capacity c. 50 locos, 2 Thl (25 m.). W.</p> <p>Storage Sidings: S of loco. depot. c. 6 DES (c. 470 m.).</p> <p>Goods Station: N of loco. depot. SER. Wb (40 t). Cr (8 t). 6 LS for storage, c. 300 m. long. Several DES with road access.</p> <p>J for DT main line. Würzburg-Bamberg-Nürnberg (Route 100), also with ST branch line to Kitzingen, on Route 90—distance to Kitzingen 49.9 km.</p>

ROUTE 101

NÜRNBERG-FÜRTH-BAMBERG-HOCHSTADT-MARKTZEULN-NEUENMARKT-WIRSBERG
OBERKOTZAU-HOF

General Description

From Nürnberg to Hochstadt, this route forms part of the main line to Leipzig and Berlin, whilst the section Hochstadt to Hof, which is not electrified, provides the main line service from Nürnberg to Dresden and also an alternative route to Leipzig, although sharp curves N of Hof are restrictive to speeds and wheelbase.

The line runs N to Bamberg up the wide Regnitz valley, keeping close to the main road, river, and Ludwigs Kanal. From Bamberg, it takes a wide north-easterly curve up the Main valley to Mainleus, whence it continues through a succession of valleys to Neuenmarkt-Wirsberg. From this point it follows a more winding course through narrow valleys to Münchberg, ascending from 300 m. to 600 m. It then descends gradually through more open country, finally following the Sachs Saale valley to Hof (alt. 489 m.).

The most important junctions are at Nürnberg (see Plan 34), at Fürth (J with Route 90), at 63.7 km. (J with Route 100), at 95.0 km. (J with ST s.o. line connecting with Route 102), at 103.9 km. (J with DT s.o. line to Saalfeld), at Neuenmarkt-Wirsberg (J with ST s.o. line connecting with Route 102), at 132.4 km. (J with Route 100), and at Oberkotzau (J with ST s.o. line to Franzensbad and Eger).

The track is double throughout, being electrified as far as Hochstadt-Marktzeuln.

The line frequently crosses the main road and also many streams and small rivers. The most important bridges are the three over the R. Main at 104.2 km., 104.4 km. and 104.9 km. Also, bridge over Ludwigs Kanal (at 6.2 km.), bridge over R. Rednitz (at 8.9 km.), bridge over R. Regnitz (at 12.7 km.), and bridge over the R. Sachs-Saale (at 187.2 km.). There are no tunnels.

General Details

- GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
- LENGTH: 189.6 km. (117½ miles).
- TRACE:
 - Nürnberg-Hochstadt-Marktzeuln, double electrified.
 - Hochstadt-Marktzeuln-Hof, double steam.
- MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
- MAXIMUM GRADIENT: 25 per mille (1 in 40).
- MINIMUM RADIUS OF CURVES: 292 m.
- TRACTION:
 - Nürnberg-Hochstadt-Marktzeuln, electric.
 - Hochstadt-Hof, steam.
- MAXIMUM DISTANCE BETWEEN STATIONS: 8.3 km. (5 miles).
- ENGINE SHEDS: Nürnberg. Hof.
- MARSHALLING FACILITIES:
 - Nürnberg. Hof (Oberkotzau).
- WATERING FACILITIES:
 - Nürnberg. Hof.
- VULNERABLE POINTS: Marked with asterisk in text.
 - (a) Locomotive and marshalling facilities at Nürnberg and Hof.
 - (b) Railway workshops at Nürnberg and Hof.
 - (c) Junctions at Nürnberg, Fürth, Bamberg, Lichtenfels, Hochstadt-Marktzeuln, Kulmbach (122.9 km.), Neuenmarkt-Wirsberg, Oberkotzau (132.4 km. and 135.2 km.).
 - (d) Bridges at 1.4, 1.9, 6.2, 12.7, 63.7, 104.2, 104.4, 104.9, 187.2 km.
- CAPACITY:

	Trains per day each way	Net train load tons
With electric traction	90	600
With steam traction	72	500

NURNBERG TO HOV

55

Distance from Nurnberg

Km.	Stations	Engineering works	Details and facilities
173.6	MUNZHEN	Route 87.	
178.5	HEILBRONN	Route 74.	
182.2	WÜRZBURG	Route 50.	
181.4	EGER	Route 102.	
160.9	FCETM	Route 103.	
100.6	REGENSBURG	Route 104.	
0	NURNBERG (Central Hbf.)	..	<p>Passenger Station. c. 6 platforms (4 island).</p> <p>Goods Station. SER. Wb (48 t). Cr (20 t).</p> <p>Marshalling Yard. Capacity 4,000 per 24 hours— natural gravity yard with small hump and retarder to regulate gravitation. 10 Reception Roads. 57 Marshalling Roads. 11 Sorting Sidings. 19 Departure Roads. 15 Storage Sidings. 11 Sidings for private siding traffic.</p> <p>Repair Shops in MY. Locomotive and Carriage and Wagon, total employed, including staff at Augsburg, 3,500.</p> <p>RpS also at Rothenburgerstrasse station.</p> <p>Loco Depot at MY 2 ES (RH), holding capacity c. 50-60 locos. 2 Tbl. W. 2 ES and RpS also at Rothenbur- gerstrasse.</p> <p>For location diagram of railway installations in Nürnberg area, see Plan 34 and air photographs of Central station Plan 34b.</p> <p>J (right) with electrified line to München (Route 87).</p> <p>Line curves NW and runs along- side canal for straight stretch c. 2.5 m. long.</p> <p>J (facing) left, with DT s.o. line to Heilbronn (Route 74).</p> <p>Line passes under electrified line to München (Route 87) and also to MY.</p> <p>J (trailing) left, with DT s.o. line from Treuchlingen (Route 87).</p> <p>Passenger station. Loco Depot: 1 ES (rectangular), 2 ES (RH). 2 Tbl. W. RpS (Loco, Goods, and Passenger Rolling Stock). Line runs DT.</p>
0.5	..	..
1.2	..	..
1.2	..	..
1.4	..	Railway overbridge.	
1.7	..	..
2.1	NURNBERG- ROTHENBURGERSTRASSE	..	
3.5	NURNBERG- NEUENDERSBUHL	..	
4.0	..	Fly-over.	
		Fly-over.	
4.1	NURNBERG- NEUENDERSBUHL	..	
4.2	..	..

Km.	Stations	Engineering works	Details and facilities
6.4	..	..	J (trailing) left, with DT connection from Nürnberg-Ost and MY line.
7.7	FÜRTH Hbf.	..	SER. Wb (41 t). Cr (15 t).
8.9	..	Bridge over R. Rednitz.	J (facing) left, with DT s.o. line to Würzburg (Route 10).
9.3	..	..	Also, J (facing) left, with ST DE s.o. line to Cadolzburg (distance 12.5 km. Axle load 15. Line curves N.
9.6	..	Bridge or culvert over stream.	..
10.2	FÜRTH-UNTERFARNBACH	..	Passenger station.
10.6	..	..	Line crosses main road.
12.7	..	Bridge over R. Regnitz.	..
14.3	VACH	..	SER. Wb (31 t).
14.9	..	Bridge or culvert over stream.	..
15.3	..	Bridge over Ludwigs Kanal.	..
16.0	..	Bridge or culvert over stream.	..
16.6	..	Ditto	..
16.8	GROSSGRÜNDLACH	..	Passenger station.
18.3	..	Ditto	..
18.8	ELTERSDORF	..	SER. Wb (32 t).
20.4	..	..	J (trailing) left, with ST s.o. DE line from Herzogenaurach (distance 11.8 km.).
20.6	ERLANGEN-BRUCK	..	..
20.7	..	Bridge or culvert over stream.	..
23.0	..	..	J (trailing) right, with ST s.o. line from Eschenau (distance 19.0 km. Axle-load 12.5 t).
23.3	ERLANGEN	..	SER. Wb (60 t). Cr (12 t).
24.8	..	Ditto	..
25.0	..	..	Line crosses main road, and runs beside it to Bubenreuth.
26.1	..	..	Line turns NE, and begins straight stretch c. 10.5 km. long.
27.3	BUBENREUTH	..	Restricted goods facilities.
30.7	..	Ditto	..
31.0	BAIERSDORF	..	SER. Wb (40 t). Cr (1.5 t).
34.6	KERSBACH	..	Restricted goods facilities.
36.9	..	..	J (trailing) left, with ST s.o. DE line from Höchststadt (distance 22.7 km.).
37.0	..	..	Line curves NW, and begins straight stretch c. 5 km. long.
37.1	..	..	J (trailing) right, with ST s.o. line from Ebermannstadt (distance 14.8 km.).
37.4	..	Ditto	..
38.2	..	Ditto	..
38.4	FORCHHEIM	..	SER. Wb (18 t). Cr (9 t). I with private light railway line running E to factory (distance c. 1.7 km.).
42.6	Line turns further NW and begins straight stretch c. 5 km. long.
43.0	..	Ditto	..
43.4	..	Ditto	..

NÜRNBERG TO HOF

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Km.	Stations	Engineering works	Details and facilities
45.3	EGGENSTÄHM	..	SR. Wb (31 t).
45.6	..	Bridge or culvert over stream.	
46.2	..	Bridge or culvert over stream (Deichs).	
48.5	BUTTENHEIM	..	SER. Line turns slightly further NW, and begins straight stretch to Bamberg, c. 14 km. long.
51.2	HIRSCHHAID	..	SER. Wb (32 t). Cr (0.6 t).
51.4	..	Bridge or culvert over stream.	
51.8	..	..	Line crosses main road.
54.6	..	..	J (trailing) left, with ST s.o. DE lines from Ebrach (distance 36.5 km.) and Schlusselfeld (distance 31.7 km.).
54.8	STÄULENDORF	..	SER. Wb (40 t).
55.1	..	Bridge or culvert over stream (Stäulendorfer).	
56.9	..	Bridge or culvert over stream.	
57.3	..	Ditto	
57.9	..	Ditto	
59.9	..	Ditto	
61.1	..	..	Line crosses main road.
61.3	..	..	J (trailing) right, with ST DE private line, distance 2.4 km.
62.1	..	..	Line crosses main road.
62.4	BAMBERG	..	SER. Wb (48 t). Cr (15 t).
62.7	..	Ditto	
63.0	..	..	Line crosses main road.
63.1	..	..	J (facing) right, with ST s.o. DE line to Schwalitz (distance 13.7 km.).
63.6	..	..	J (facing) left, with ST s.o. line to sidings.
*63.7	..	..	Line curves N. J (facing) left, with DT s.o. line to Schweinfurt (Route 100).
65.9	HALLSTADT (BEI BAMBERG)	..	SER (only 7 m. long). Wb (31 t).
66.2	..	Bridge or culvert over stream (Gundelsheimer).	
67.1	..	Bridge or culvert over stream (Leiten).	
67.6	..	Bridge or culvert over stream.	
68.9	..	Ditto	
70.0	BREITENGÜNBACH	..	SER. Wb (40 t). Cr (3.5 t).
70.3	..	Bridge or culvert over stream.	
70.7	..	..	J (facing) left, with ST s.o. DE line to Maroldsweisach (distance 33.8 km.).
70.9	..	..	Line crosses main road.
72.2	..	..	J (facing) left, with ST s.o. line to Dietersdorf (distance 31.9 km.).
73.0	..	Ditto	
74.5	EMING	..	Passenger station. Limited cattle facilities.
76.4	..	Ditto	
78.7	LAUFEN S. O.	..	SER. Wb (40 t).
79.0	..	Ditto	
80.2	..	Ditto	
82.1	..	Bridge or culvert over stream (K. O.).	

Km.	Stations	Engineering works	Details and facilities
82.6	EMMERKELD	..	SER. Wb (29 t).
83.1	..	Bridge or culvert over stream.	
87.9	..	Bridge or culvert over stream (Lauter).	
88.1	STAFFELSTEIN	..	SER. Wb (31 t).
89.2	..	Bridge or culvert over stream.	
90.6	..	Ditto	
91.2	..	Ditto	
91.8	..	Ditto	
92.2	..	Ditto	
94.2	..	Ditto	
94.3	LICHTENFELS	..	SER. Wb (40 t).
94.6	Line crosses main road and curves E.
*95.0	J (facing) left, with ST s.o. line to Coburg and Meiningen (Route 101a).
98.5	MICHELAU	..	SER. Wb (32 t).
98.9	..	Bridge or culvert over stream.	
101.2	Line turns SE.
102.6	HOCHSTADT-MARKTZEULN	..	SER. (only 7 m. long). Wb (40 t). Cr (0.75 t).
102.8	..	Ditto	
102.9	Line crosses main road and turns E.
*103.9	J (facing) left, with ST s.o. line to Saalfeld (distance 79.6 km.). End of electric section.
*104.2	..	Bridge over arm of R. Main.	
*104.4	..	Ditto	
*104.9	..	Ditto	
105.0	Line curves SE.
107.6	..	Bridge or culvert over stream.	
108.2	BURGKUNSTADT	..	SER. Wb (40 t). Cr (0.75 t).
110.8	Line turns E.
112.8	..	Ditto	
113.3	Line turns SE, and begins straight stretch c. 6 km. long.
113.8	MAINROTH	..	SER. Wb (31 t).
117.3	..	Ditto	
118.4	Line crosses main road.
119.0	MANLEUS	..	SER. Wb (40 t).
119.4	..	Road overbridge.	Line curves NE.
120.0	..	Bridge or culvert over stream.	
120.4	..	Ditto	
121.7	..	Ditto	
122.3	Line crosses main road.
*122.9	Line crosses main road. J (trailing) right, with ST s.o. line from Bayreuth (distance 42.2 km.).
123.1	J (facing) right, with ST s.o. DE line to industrial concerns (distance c. 1 km.).
123.6	..	Bridge or culvert over stream.	
123.4	NEUMBACH	..	SER. Wb (30 t). Cr (10 t).
124.3	Line crosses main road.
124.9	..	Ditto	
125.3	Line turns ..
125.8	Line crosses main road.

Km.	Stations	Engineering works	Details and facilities
125.9	J (facing) left, with ST s.o. DE line to industrial concerns (distance 0.4 km.).
126.9	..	Bridge or culvert over stream.	Line curves NE.
127.5
130.7	UNTERSTEINACH (BEI STADTSTEINACH)	..	SER. Wb (31 t.).
130.9	..	Ditto	..
131.1	Line curves SE.
131.2	J (facing) left, with ST s.o. DE line to Stadtsteinach (distance 4.8 km.). Goods traffic only.
132.7	..	Ditto	..
133.1	LUDWIGSCHORGAST	..	Restricted goods facilities.
133.6	Line curves SSE.
134.5	..	Bridge or culvert over stream (Schorgast).	..
134.7	..	Bridge or culvert over stream.	..
135.7	..	Ditto	..
136.3	..	Ditto	..
136.8	NEUENMARKT-WIRTSBERG	..	SER. Wb (40 t.). Cr (4.5 t.).
137.2	Line crosses main road.
*137.7	J (facing) right, with ST s.o. line to Bayreuth and Schnabelwaid (on Route 102). Distance to Bayreuth 21.0 km., and to Schnabelwaid 39.2 km.
137.9	Line curves E.
138.6	Line curves SE.
139.1	..	Ditto	..
140.3	Line crosses 400 m. contour line.
141.2	Line turns NE, and climbs to higher ground through gap in hills.
143.9	Line crosses 500 m. contour line.
144.2	..	Bridge or culvert over stream.	..
144.3	MARKTSCHORGAST	..	SER. Wb (40 t.). Cr (1.6 t.).
144.6	Line curves E.
144.9	Line curves S.
145.5	Line curves NE.
147.0	Line curves N.
148.9	FALLS	..	SER. Wb (30 t.).
149.0	J (facing) right, with ST s.o. DE line to Gefrees (distance 5.3 km.).
153.3	Line takes wide curve NE-N-NW.
155.5	STANNBACH	..	SER. Wb (30 t.).
156.8	Line curves NW.
157.2	Line curves NNE.
157.6	Line crosses 600 m. contour line.
158.2	Line curves N.
158.8	Line gradually curves NE.
160.8	Line curves E.
161.7	Line curves NE, passing 700 m. contour line.
162.9	Line curves E.
163.3	Line crosses main road.
*163.7	..	Road overbridge.	Line crossed by Autobahn.
164.1	Also J (trailing) left, with ST s.o. line from Selbitz (distance 19.3 km.).
164.5	..	Bridge or culvert over stream.	Line recrosses main road.
165.4	MUSCHENBERG	..	SER. Wb (40 t.). Cr (1.2 t.).
165.5	Line curves NE.

Km.	Stations	Engineering works	Details and facilities
167.7	J (facing) right, with ST s.o. DE line to Zell (distance 10.1 km.).
168.1	..	Bridge or culvert over stream.	Line curves ENE. Line curves NE.
168.1	Line curves E.
168.9	Line curves NE-SE.
169.0	..	Ditto	..
170.0
171.3
171.7	..	Ditto	..
172.0	SEULBITZ	..	Wb (31 t). Line turns S. Line curves SE.
172.1
172.7
172.8	..	Ditto	..
173.7	Line curves E.
174.2	..	Bridge or culvert over stream (Gouitz).	Line curves NE and then N.
174.3
175.3	..	Bridge or culvert over stream.	Line curves E.
175.8
176.1	FORBAU	..	Passenger station. Line crosses 500 m. contour line. Line curves N, and then NE.
176.2
176.3
177.8	..	Ditto	..
178.0	Line curves NNE.
178.4	..	Ditto	..
178.6	SCHWARZENBACH (SAALE)	..	SER. Wb (40 t). Line crosses road. Line curves NNW. Line curves N. Line turns NNW. Line turns N.
178.9
179.0
179.8
180.7
181.2	..	Bridge or culvert over stream (Lamitz).	Line turns NNW. J (trailing) right, with DT s.o. line from Marktredwitz (Route 107).
182.3
182.4
184.0	OBERRKOTZAU	..	SER. Wb (40 t). J (trailing) right, with ST s.o. line from Franzensbad (distance 17.8 km.), thence DT to Eger (distance 6.7 km.). Line curves E. Line curves N.
185.2
186.2	..	Bridge or culvert over stream.	Line curves NW.
186.9
187.2	..	Bridge or culvert over river (Sachs Saale).	..
187.3	HOF-MOSCHENDORF	..	Passenger station. Line curves N, and then NNE. Line curves N. Line curves NW.
188.2
188.6
189.6	HOF HBF.	..	SER. Wb (40 t). Cr (30 t). MY. RpS (Loco and C. W.), Loco Depot. J for ST s.o. line to Eichicht and Triptis on main line Hochstadt-Saalfeld-Leipzig. Line continues N as main line to Leipzig (distance 170.6 km. from Hof) and also to Dresden (225.6 km. from Hof). Loco Depot. ERS (RIV). Total servicing capacity c. 150 locos, equipped to deal with running repairs for all normal types of locomotives. 2 FBL 25.50 m ³ W.

Km.	Stations	Engineering works	Details and facilities
			<p>RpS (Locos): Operating in 2 shifts, total employed in February, 1943, was c. 2,500 men; also small wagon repair shops adjacent <i>Loko</i> to Depot.</p> <p>Between Loco Shops and Wagon Shops; c. 20 underground reservoirs for storage of oil and petrol.</p>

ROUTE 101A MEININGEN-COBURG-LICHTENFELS

General Description

Connecting at Meiningen with *Route 100a* to Schweinfurt, and running as a continuation of the ST line from Eisenach on the Kassel-Erfurt-Leipzig main line, this line, although mainly ST and of low-carrying capacity because of the heavy grades and sharp curvature, provides the only main line service to Coburg.

The line runs SE from Meiningen, follows the valley of the R. Werra to Eisfeld where it turns S to Coburg through rather hilly country, entailing heavy gradients and several viaducts over valleys.

After leaving Coburg, the line once more follows the valleys of rivers through the Lichtenfels Forest to Lichtenfels, where it joins the main DT line from Nürnberg to Berlin via Leipzig, and to Dresden via Hof (*Route 101*).

At Themar, a facing J connects with the ST line to Schleusingen which from there runs to Ilmenau as mixed rack and adhesion, and finally to Plauen on the main Schweinfurt-Erfurt line. The gradients on this line (the Thüringerwald Railway) are 1/40 for the adhesion sections and 1/17 for the Abt rack sections, with curves of 250 m. and 200 m. respectively.

Other connections with minor lines are at Eisfeld with a metre gauge line to Unterreubrunn, and a standard gauge ST line to Sonneberg, junction for Probstzella and Stockheim on the Nürnberg-Leipzig main electrified line, at Coburg with a ST branch line to Sonneberg, and at Ebersdorf with a further single track line to Neustadt, on the Coburg and Sonneberg line.

General Details

- GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
- LENGTH: 90.2 km. (56 miles).
- TRACK:
 - Meiningen-Grimmenthal, double.
 - Grimmenthal-Coburg (Passenger Station), single.
 - Coburg (Passenger Station)-Credlitz, double.
 - Credlitz-Lichtenfels, single.
- MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
- MAXIMUM GRADIENT: 10 per mille (1 in 100).
- MINIMUM RADIUS OF CURVES: 300 m.
- TRACTION: Steam.
- MAXIMUM DISTANCE BETWEEN STATIONS: 10.5 km. (6½ miles).
- ENGINE SHEDS: Meiningen. Coburg.
- MARSHALLING FACILITIES: No details.
- WATERING FACILITIES: Meiningen. Coburg.
- VULNERABLE POINTS: Marked with asterisk in text.
 - (a) Locomotive facilities and workshops at Meiningen and Coburg.
 - (b) Junctions at Meiningen, Coburg and Lichtenfels.
 - (c) Bridges at 6.3, 7.9 27.2, 39.0 and 88.4 km.
- CAPACITY:

<i>Trains per day each way</i>	<i>Net train load tons military stores</i>
16	300

Distance from Meiningen

Km.	Stations	Engineering works	Details and facilities
*0	MEININGEN	..	SER. Wb (36 t). Cr (20 t). RpS. ES. Tbl. W. Line runs S, following valley of R. Werra to Eisfeld. Line curves SE.
3.3	..	..
4.4	UNTERMANFELD	..	Passenger station.
*4.6	..	..	J (facing) right, with DT s.o. line to Schweinfurt (<i>Route 100A</i>). Line curves E.
5.0	..	..	Line passes over DT s.o. line from Erfurt.
*6.3	..	Fly-over.	J (facing) left, with DT, s.o. line to Erfurt-Suhl Schweinfurt.
*6.7	..	..
7.4	GRIMMENTHAL	..	SER. Wb (40 t). J with DT s.o. line to Suhl and Erfurt. ST begins. Line crosses road.
7.4	..	..
*7.9	..	Bridge over R. Hasel.	Line crosses minor road.
10.6	..	..

Km.	Stations	Engineering works	Details and facilities
13.5	VAMSDORF		Passenger station.
14.2	..	Bridge or culvert over stream.	
16.0	..	Ditto	Line crosses main road.
17.8	
20.5	THIEMAR	..	SER. Wb (40 t).
22.2	J (facing) left, with ST s.o. line to Schleusingen Ost (13.0 km.), Ilmenau, and Plau.
22.5	Line crosses main road.
22.7	Line crosses minor road.
23.1	Line curves S.
23.6	..	Road overbridge.	
23.9	..	Ditto	Line curves SE.
24.2	..	Bridge or culvert over stream.	
24.8	Line turns S.
25.9	Line crosses minor road.
26.3	Ditto
26.5	REURIETH	..	Passenger station.
27.2	..	Bridge over R. Werra.	Line crosses minor road.
27.4	Line crosses main road.
31.8	I, with narrow-gauge (1 m.) DE line to Lindenau-Friedrichshall (29.1 km.).
32.2	
32.6	HILDBURGHAUSEN	..	SER. Wb (35 t).
33.0	Line crosses main road.
33.9	Ditto
34.7	Line crosses minor road.
35.0	Ditto
35.5	Ditto
38.4	Line curves NE.
39.0	..	Bridge over R. Werra.	
39.7	Line crosses main road.
40.0	VEILSDORF	..	Wb (36 t).
40.7	Line crosses road and turns N.
41.7	Line gradually curves S.
42.5	..	Bridge over stream.	
42.9	Line curves SE.
43.9	Line crosses minor road.
44.4	Line crosses main road.
44.8	Line curves NE.
46.0	Line curves E.
47.1	I, with narrow-gauge (1 m.) DE line from Unterneubrunn (17.8 km.).
47.5	ESFELD	..	SER. Wb (40 t).
48.1	Line crosses minor road and curves S.
49.0	J (facing) right, with ST s.o. line to Sonneberg (32.9 km.).
49.5	Line curves SE.
49.9	..	Fly-over.	Line crosses main road.
51.4	Line passes under ST s.o. line to Sonneberg.
51.6	..	Road overbridge.	
52.0	Line curves S.
53.5	Line turns SE.
53.9	GOSDORF (THÜR.)	..	Line crosses minor road.
55.3	Passenger station.
57.4	..	Bridge over road.	
58.1	..	Ditto	Line crosses minor road.
58.9	TIEFENLAUTER	..	Restricted goods facilities.
59.2	Line turns S.
59.6	Line crosses minor road.

Km.	Stations	Engineering works	Notes
61.9	..	Bridge over road.	
62.2	..	Ditto	
63.4	..	Road overbridge.	
64.1	..	Viaduct.	c. 400 m.
64.3	..		Line crosses minor road.
64.5	..	Bridge or culvert over stream.	
65.0	..		Line crosses minor road.
65.7	..	Bridge over road.	
*66.3	..		J (trailing) left, with ST s.o. line from Neustadt (bei Coburg) and Sonneberg (19.5 km.). DT begins.
67.8	..		Line crosses main road.
68.2	..		Line crosses minor road.
68.5	..		Ditto
68.6	..		Line curves S.
68.7	..		J (trailing) right, with ST s.o. DE line from Rodach (17.7 km.).
69.4	COBURG		Passenger station.
70.8	COBURG Gbf		Goods station only. SER. Wb (40 t). Cr (25 t). ES. Tbl. W. RpS (goods wagons). Line turns SE.
71.5	..	Bridge over river.	
72.0	..		Line curves S.
72.5	..	Bridge or culvert over stream.	
74.3	CREIDLITZ		J (facing) right, with ST s.o. DE line to Rossach (8.1 km.). ST begins.
75.5	..	Bridge or culvert over stream.	Line curves E.
76.0	..		Line crosses main road.
76.3	..	Bridge over river.	
77.3	GRUB AM FORST		Passenger station.
77.4	..	Bridge over river.	
78.2	..		Line crosses minor road.
79.2	..		Ditto
79.6	..		Line begins wide curve S.
80.1	..	Bridge or culvert over stream.	
80.4	EBERSDORF (BEI COBURG)		SER. Wb (35 t). J (facing) left, with ST s.o. line to Neustadt (bei Coburg) (30.2 km.).
80.7	..	Road overbridge.	
81.3	..	Bridge or culvert over stream.	
83.5	..	Bridge over river.	
87.5	SCHNEY		Restricted goods facilities.
88.1	..		Line crosses minor road.
*88.4	..	Bridge over R. Main.	
*89.9	..		J (trailing) left, with DT s.o. line from Hochstadt (Route 101).
*90.2	LICHTENFELS		SER. Wb (40 t). J for the main line, Nürnberg-Leipzig (Route 101).

ROUTE 102

NÜRNBERG-SCHNABELWAID-KIRCHENLAIBACH-MARKTREDWITZ-EGER (CHIEF)

General Description

The line, which is steam-operated and mainly ST, provides the route for the direct service to Eger (Chief) on the NW frontier of Czechoslovakia, Karlsbad and Dresden.

Junctions at Nürnberg (see Plan 34) connect with lines N to Bamberg, Leipzig and Berlin (Route 100), Würzburg (Route 90), W to Ansbach and Karlsruhe (Route 74), S to München (Route 87) and Regensburg and Passau (Route 104), and E to Fürth and Pilsen (Route 103). En route, the principal junctions are at Schnabelwaid for Bayreuth, Kirchenlaibach for Bayreuth and Neuenmarkt-Wirsberg and for Weidern to the S, at Marktredwitz for the main line N to Hof, S to Weisau (Route 107), whilst at Eger the line divides into two DT main lines, one S. to Karlsbad, the other N to Plauen on the line Hof-Leipzig, and in addition ST lines connect SW. to Weisau on Route 107, and SE to Pilsen.

From Nürnberg the line follows the valley of the R. Pegnitz which at Hohenstadt turns sharply N and narrows considerably, following a winding course all the way, involving many bridges over the river and tunnels through escarpments in order to avoid very sharp curves.

Shortly after leaving Pegnitz, the line leaves the Pegnitz valley and turns NE to follow the valley of the Weiher to its source and continues to the Czech border through hilly country involving two more tunnels.

Gradients are severe and have a general tendency to rise all the way from Nürnberg to Eger.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 151.4 km. (94 miles).
3. TRACK:
Nürnberg-Marktredwitz (124.2 km.), double.
Marktredwitz-Eger (27.2 km.), single.

4. MAXIMUM PERMITTED AXLE LOAD: 20 metric tons.

5. MAXIMUM GRADIENT: 12½ per mille (1 in 80).

6. MINIMUM RADIUS OF CURVES: 300 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

DT:

10.4 km. between Immenreuth and Neusorg.

ST:

9.4 km. between Mühlbach and Eger.

9. ENGINE SHEDS:

Nürnberg. Eger.

No other details.

10. MARSHALLING FACILITIES:

Nürnberg.

No other details.

11. WATERING FACILITIES:

Nürnberg. Eger.

No other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Marshalling facilities at Nürnberg.

(b) Locomotive sheds and repair shops at Nürnberg and Eger.

(c) Bridge 1.6 km., 3.1 km.; over Pegnitz between 35.1 and 60.8 km.

(d) Tunnels at 43.9, 45.7, 46.5, 46.8, 47.0, 47.8, 88.2 and 116.7 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Nürnberg-Marktredwitz	48	300-400
Marktredwitz-Eger	12	300-400

Distance from Nürnberg Hbf.

Km.	Stations	Engineering works	Details and facilities
189.6	HOF	Route 101.	
160.9	FÜRTH	Route 103.	
218.1	PASSAU	Route 104.	
*0	NÜRNBERG HBF.		SER. Wb (48 t). Cr (20 t). MY. RpS (loco. and carriage and wagon). Loco. depot. For description of facilities see Route 101.
1.6		Fly-over.	J (facing) left, with DT s.o. line to Regensburg (distance 106.6 km.).
*1.9			Line passes under DT line to Regensburg.
*2.7			J (facing) right, with DT s.o. line to Neukirchen (Route 103).
			Line curves N.
			Line crosses 300 m. contour-line.
			J (trailing) right with ST loop connection from Regensburg line.
*3.1		Bridge over R. Pegnitz.	c. 50 m. long.
			Line curves NNE.

Km.	Stations	Engineering works	Details and facilities
3.9 4.6	NÜRNBERG OTT ..	.. ..	SER. Wb (40 t). Cr (9 t). J (facing and trailing left), with ST s.o. line to Nürnberg Nord-Cost, Nord and Nord-West (goods and cattle only). Distance 9.7 km.
5.2	..	Bridge or culvert over stream.	Line curves NE, following Pegnitz valley to Lauf.
5.6	..	..	Line crosses Autobahn, and runs close beside main road to Lauf.
5.7 6.9 9.4	NÜRNBERG-ERLENSTEDEN .. ..	.. Ditto ..	Passenger station. Line curves NNE.
10.1 10.6 12.1	BEIRINGSDORF .. ..	.. Ditto Ditto	SER. Wb (30 t). Line turns NE.
12.7 13.8	RÜCKERSDORF .. ..	.. Ditto	SER. Wb (30 t).
14.3 15.5 16.2	LUDWIGSHÖHE .. ..	.. Bridge or culvert over stream (Bitter).	Passenger station. Line turns NNE.
16.8 17.5 19.0 19.7	LAUF (right bank of Peg- nitz) .. .. ..	.. .. .. Bridge or culvert over stream.	SER. Wb (40 t). Cr (0.75 t). Line curves E. Line crosses Autobahn.
20.1 20.4 20.6	SCHNAITZACH .. ..	.. Ditto ..	SER. Wb (31 t). J (facing) left, with ST, s.o. DE line to Simmelsdorf-Hüttenbach (distance 9.8 km.).
21.4 24.1	.. ..	.. Ditto	Line turns ESE, following main road closely to Hohenstadt.
24.5 25.6 26.9	REICHENSWAND .. ..	.. Ditto Ditto	SER. Wb (32 t). Line crosses minor road.
27.7 31.0 32.0 32.7 32.8	HEINRICH (right bank of Pegnitz) .. .. .. ..	.. .. .. .. ..	SER. Wb (40 t). Line crosses main road. J (facing) right, with ST s.o. line to Pommelsbrunn (Route 103). Line curves N. Line crosses main road.
33.6	HOHENSTADT	..	SER (only 7 m. long). Wb (31 t). Here the Pegnitz valley becomes narrower, and line follows wind- ing course to Velden.
35.1 35.6 35.9 36.8 38.4 38.7	.. .. .. .. .. ..	Bridge over R. Pegnitz. Ditto Ditto Ditto Ditto ..	Line turns N. Line curves NNE. Line curves N.
39.8 40.7 41.7 41.1 41.0 41.1	VORRA (PEGNITZ) .. .. .. .. .. ..	.. .. Ditto Ditto Ditto Ditto	SER (only 7 m. long). Wb (30 t). Line curves NW.

Km.	Stations	Engineering works	Details and facilities
43.7	..	Bridge over R. Pegnitz.	Line curves N and then NE.
43.8	..	Tunnel.	c. 250 m. long.
43.9	SER. Wb (30 t).
44.5	RUPPRECHTSTEGEN	..	..
45.7	..	Bridge over R. Pegnitz.	c. 100 m.
46.4	..	Tunnel.	c. 150 m. long.
46.5	..	Bridge over R. Pegnitz.	c. 100 m. long.
46.7	..	Tunnel.	c. 400 m. long.
46.8	..	Bridge over R. Pegnitz.	..
46.9	..	Tunnel.	..
47.0	..	Bridge over R. Pegnitz.	..
47.5
47.6	VELDEN (BEI HERSBRUCK)	..	Wb (40 t).
47.7	..	Ditto	c. 150 m. long.
47.8	..	Tunnel.	..
48.1	..	Bridge over R. Pegnitz.	Line curves NNE.
49.0
50.0	..	Ditto	..
50.4	..	Ditto	..
50.7	NEUBAU (PEGNITZ)	..	SER. Wb (30 t).
51.1	..	Bridge over R. Pegnitz.	Line curves N.
51.6	..	Ditto	..
51.8	Line curves NE.
53.2	Line curves NW.
54.2	BANNA	..	SER. Wb (40 t).
54.6	Line curves NE.
54.7	J (facing) right, with ST s.o. DE line to Auerbach (distance 8.1 km.).
58.6	..	Bridge over R. Pegnitz.	..
59.4	..	Ditto	..
60.0	..	Ditto	..
60.5	MICHELFELD (OBERPF.)	..	SER. Wb (32 t).
60.8	..	Ditto	..
65.5	..	Ditto	..
65.6	..	Ditto	..
65.8	..	Ditto	..
66.1	..	Ditto	..
66.9	PEGNITZ	..	SER. Wb (48 t). Cr (1 t).
68.6	Line curves E, keeping close to main road, and following valley of small R. Weiher to Schnabelwaid.
70.7	Line curves NE.
71.3	..	Bridge or culvert over stream.	..
71.8	..	Bridge or culvert over stream.	..
72.9	..	Ditto	..
75.0	SCHNABELWAID	..	SER. Wb (30 t).
75.1	J (facing) left, with ST s.o. line to Bayreuth (distance 18.2 km.).
75.7	..	Ditto	..
76.4	Line curves SE.
78.3	Line curves E.
78.5	Line crosses 500 m. contour line.
79.1	Line crosses main road.
79.7	ENGELMANNREUTH	..	SER. Wb (30 t).
81.3	..	Ditto	..
82.6	..	Ditto	Line curves NE.
84.4
85.0	Line curves E.
85.8	VORBACH (OBERPF.)	..	SER. Wb (30 t).
86.6	Line curves NE.
88.2	..	Tunnel.	c. 450 m. long.

Km.	Stations	Engineering works	Details and facilities
88.9	Line curves NNW.
89.3	..	Bridge or culvert over stream.	..
91.3	..	Ditto	Line curves E.
92.3	J (trailing) left, with ST s.o. line from Bayreuth (distance 18.8 km).
*93.1
93.7	KIRCHENLAIBACH	..	SER. Wb (40 t).
*94.3	J (facing) right, with ST s.o. line to Weiden (distance 39.3 km.).
94.4	Line curves N and NE
94.9	..	Bridge or culvert over stream (Flernitz).	..
95.6	Line crosses main road.
97.9	Line curves N.
97.2	..	Bridge or culvert over stream (Haid Naab).	..
97.5	HAIDENAAH-GÖPPMANN-SÜHL	..	Passenger station.
99.0	..	Bridge or culvert over stream.	Line curves NE.
101.6	Line curves NNE.
102.0	..	Bridge or culvert over stream (Flöt).	..
102.4	IMMENREUTH	..	SER. Wb (30 t).
103.6	..	Bridge or culvert over stream.	..
104.0	Line curves SE.
104.7	Line crosses main road.
106.9	Line curves NE.
109.8	Line turns NNE.
110.9	Line curves N.
111.8	..	Ditto	..
112.2	J (trailing) left, with ST s.o. DE line from Fichtelberg (distance 14.7 km.).
112.3	Line curves E.
112.8	NEUSORG	..	SER. Wb (40 t).
113.4	Line curves NE.
114.9	..	Ditto	..
120.6	..	Bridge or culvert over stream. (Kosain).	..
121.2	WALDERSHOF	..	SER. Wb (31 t).
*123.6	J (trailing) right, with DT s.o. line from Wiesau (Route 107).
124.2	MARKTREDWITZ	..	SER. Wb (40 t). Cr (17.5 t).
*124.7	DT ends, ST begins.
125.7	J (facing) left, with DT s.o. line to Oberkotzau (Route 107).
126.6	Line touches 500 m. contour line.
126.7	..	Bridge or culvert over stream (Rodelau).	..
131.2	SEUSEN	..	SER. Wb (32 t) Cr (1.5 t).
131.5	..	Bridge or culvert over stream.	..
131.6	..	Bridge or culvert over stream (Rodelau).	..
134.9	ARZBERG	..	SER. Wb (40 t).
136.7	..	Bridge or culvert over stream.	..
138.1	SCHURDING	..	SER. Wb (40 t).
138.5	Line crosses main road.
140.1	..	Ditto	..
141.2	Line curves SE.
141.6	Line re-crosses main road.

Km.	Stations	Engineering works	Details and facilities
142.0	MÜHLBACH	..	Passenger station.
142.5	..	Bridge or culvert over stream.	..
142.7	Line curves NE.
143.2	Line turns E.
144.4	Line curves SE.
147.0	..	Ditto	..
148.8	Line crosses main road.
149.5	Line curves NE.
*150.5	J (trailing) right, with ST s.o. lines from Pilsen and Wirsau.
*151.4	ROER (CHEN)	..	SER. Wb (40 t). Cr (15 t). ES (RH) employing 230 personnel—capacity not known. Also running repair shops, employing 69 personnel. J for DT main line to Karlsbad and Dresden, also Plauen and Leipzig and for ST lines referred to above.

ROUTE 102A

SCHNABELWAID-BAYREUTH-NEUENMARKT-WIRSEBERG

General Description

Although only ST, yet by connecting with the main DT lines, Routes 101 and 102, this line provides the only main line service to Bayreuth, both from the Bamberg direction and also by the more direct route via Schnabelwaid.

At Bayreuth trailing junctions connect with a ST line from Kirchenlaibach (on Route 102) and with a ST local line from Kulmbach (on Route 101).

From Schnabelwaid to Neuenreuth, the line follows the valley of the R. Weiher and rising gradients may be expected, increasing after leaving Neuenreuth when it enters rather more hilly country, before entering the broad valley of the Trebgast R. at Bayreuth which it follows for the rest of the journey.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 39.2 km. (24½ miles).
3. TRACK: Single.

Distance from Schnabelwaid

4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: No details, but will most probably be found to be heavy.
6. MINIMUM RADIUS OF CURVES: No details.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 8.4 km. (5¼ miles).
9. ENGINE SHEDS: No details.
10. MARSHALLING FACILITIES: No details.
11. WATERING FACILITIES: No details.
12. VULNERABLE POINTS: No important engineering works appear to exist, and the most vulnerable points of the line are the junctions at Schnabelwaid, Bayreuth and Neuenmarkt-Wirsberg.
13. CAPACITY:

Trains per day each way	Net train load tons military stores
12	300-400

Km.	Stations	Engineering works	Details and facilities
0.	SCHNABELWAID	..	SER. Wb (30 t). Line crosses road.
0.8	..	Bridge or culvert over stream.	J (facing) right with DT s.o. line Nürnberg-Marktredwitz-Hof (Route 102).
1.2	..	..	Line crosses main road from Creusen to Regnitz.
2.8	..	..	Line re-crosses main road.
3.8	..	..	Line crosses main road from Creusen.
4.7	..	Ditto	Line crosses minor road.
5.6	CREUSEN	..	Line crosses 2 small roads.
8.6	..	Ditto	SER. Wb (40 t). Line crosses 2 minor roads.
9.2	..	..	..

Km.	Stations	Engineering works	Details and facilities
9.8	NEUENREUTH		Passenger station. Restricted cattle facilities. Line crosses main road from Bayreuth to Creusen after station. Line crosses minor road. Carrying main road, from Trochau to Münchberg. Line crosses several minor roads. Line crosses main road, from Bayreuth to Creusen.
12.1	..	Road overbridge	(1) J (trailing) left with ST s.o. dead end line from Hollfeld (32.8). (2) J (trailing) right with ST s.o. line from Kirchenlaibach on Route 102—distance 18.8 km.
14.9	..	..	Line crosses 2 minor roads.
*16.2	..	..	Line crosses 2 minor roads.
		2 bridges or culverts over streams.	
18.2	BAYREUTH Hbf.	..	SER. Wb (48 t). Cr (10 t). J (facing) right with ST s.o. dead end line to Warmensteinach (32.9 km.) Line crosses minor road before station.
19.7	..	..
22.4	BENDLAGE	..	SER. Wb (30 t). Line follows valley of R. Trebgast to Trebgast.
23.1	..	Bridge over river Trebgast	Line crosses main road from Wirsberg.
24.4	..	..	Line crosses 2 minor roads.
25.7	RAMMENTHAL	..	Passenger station. Restricted facilities for dealing with cattle. Line crosses minor road. Line re-crosses main road from Wirsberg before reaching Harsdorf station.
28.7	HARSDORF	..	SER. Wb (30 t). Line crosses minor roads.
32.4	..	..	Line crosses main road under construction.
33.6	..	Bridge or culvert over stream.	
34.0	TREBGAST	..	SER. Wb (30 t). Line crosses and re-crosses main road from Wirsberg after Trebgast station and curves sharply right to cross the main road again.
35.6	..	Bridge or culvert over stream (Weimer).	
36.1	..	..	J (trailing) right with ST s.o. DE line from Bischofsgrün (21 km.).
		2 bridges or culverts over streams.	
*38.3	..	..	J (trailing) right with DT s.o. line to Nürnberg (Route 101).
39.2	NEUENMARKT-WIRSBERG	..	SER. Wb (40 t). Cr (4.5 t).

ROUTE 103

NÜRNBERG HBF-NEUKIRCHEN-IRRENLOHE-SCHWANDORF-CHAM-FÜRTH-IM-WALD

General Description

Forming the main route for trains from Nürnberg to Fürth on the Czechoslovakian border, this line runs DT in an easterly direction along the Pegnitz valley to Hersbruck, whence it follows the narrow, winding valley of a tributary of the Pegnitz, and after reaching the source crosses the watershed and turns SE down the valleys of the R. Regen and R. Ilz to Amberg.

At Amberg the line leaves the Ilz valley, and crosses the Freiholzer Forest to Irrenlohe, where it joins and runs in common with Route 107 (DT main line to Regensburg Hbf) to Schwandorf.

After leaving Schwandorf the line branches away from Route 107 and crosses high forest land into the Regen valley to Cham, whence it turns NE and follows the R. Cham into the mountainous region of the Böhmer Wald to Fürth.

The principal junctions are at Nürnberg (see Plan 34); at Pommelsbrunn where a trailing connection with Route 102, which runs along the other side of the Pegnitz valley, provides an alternative route from Nürnberg; at Irrenlohe and Schwandorf with Route 107, and at Cham with the ST branch line to Straubing.

The heaviest gradients will be between Hersbruck and Amberg, Schwandorf and Posing, and Cham and Fürth, whilst the sharpest curves will be between Hersbruck and Amberg, Cham and Fürth.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.) standard.

2. LENGTH: 160.9 km. (100 miles).

3. TRACE:

Nürnberg-Amberg, double.

Amberg-Irrenlohe, single.

Irrenlohe-Schwandorf, double.

Schwandorf-Fürth, single.

4. MAXIMUM PERMISSIBLE AXLE LOADS:

Nürnberg Hbf-Posing, 20 metric tons.

Posing-Cham, 18 metric tons.

Cham-Fürth-im-Wald, 16 metric tons.

5. MAXIMUM GRADIENT: 12 per mille (1 in 25).

6. MINIMUM RADIUS OF CURVES: 500m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

10.2 km. (6½ miles).

Neukirchen 45.1 km.-Sulzbach-Rosenberg,

55.3 km.

9. ENGINE SHEDS:

Nürnberg.

Schwandorf.

10. MARSHALLING FACILITIES: Nürnberg.

11. WATERING FACILITIES:

Nürnberg.

Schwandorf.

No other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Locomotive and marshalling facilities given in 9 and 10 above.

(b) Junctions at Nürnberg, Pommelsbrunn, Irrenlohe, Schwandorf and Cham.

(c) Bridge at 92.9 km.

13. CAPACITY:

Trains per day Net train load tons
each way military stores

Nürnberg-Amberg 48

300-400

Amberg-Fürth 12

300-400

(Throughout capacity)

Distances from Nürnberg

Km.	Stations	Engineering works	Details and facilities
0	NÜRNBERG HBF	..	ES. Tbl. W. RpS (Locos, carriage and wagon). SER. Wb (48 t). Cr (20 t). For details see Route 101 and location diagram Plan 34. Junction for— (1) DT s.o. line to Würzburg (Route 90). (2) DT line to Treuchtlingen (Route 67). (3) DT s.o. line to Passau (Route 104). (4) DT electrified line to Snaalfeld. (5) DT s.o. line to Bretten (Route 74). Line runs NE to Lauf in the valley of the R. Pegnitz. J (facing) left with DT s.o. line to Regensburg (Route 104). Line passes under DT s.o. line to Regensburg (Route 104). J (facing) left with DT s.o. line to Schnabelwald, Hof and Eger (Route 102). Line crosses connection from Regensburg to Eger line which avoids Nürnberg Hbf. J (trailing) right with ST connection from Regensburg line (Route 104). Line crosses minor road.
1.6	..	Fly-over	..
1.9	..	Bridge over line.	..

Km.	Stations	Engineering works	Details and facilities
4.1	NÜRNBERG-MÖGELDORF		SER. Wb (40 t). Line crosses 2 minor roads. Carrying autobahn. Line crosses minor road.
5.5	..	Road overbridge.	
6.8	LAUFAMHOLZ	..	SER. Wb (30 t). Line crosses minor road at station.
8.2	..	Bridge or culvert over stream.	
9.3	SCHWAIG	..	Passenger station. Line crosses minor road at station.
11.6	RÖTHENBACH (PEGNITZ)	..	SER. Wb (40 t). J (facing) right with short DE Line crosses minor road.
12.2	..	Bridge or culvert over stream (Röthen).	
14.6	..	Bridge or culvert over stream.	Line crosses several minor roads.
16.9	LAUF (left bank of Pegnitz)	..	Ditto. SER. Wb (40 t). Line crosses minor road. Carrying autobahn. Line continues in the valley of R. Pegnitz to Pommelsbrunn. The line runs E. to Hartmannshof. Line crosses minor road.
17.8		Road overbridge.	
20.7	OTTENSOOS	..	SER. Wb (31 t). Line crosses 2 minor roads.
22.4	..	Bridge or culvert over stream.	
23.4	..	Ditto	Line crosses minor road.
24.4 24.8	HENFENWELD	Bridge or culvert over stream (Hamer).	SER. Wb (30 t). Line crosses secondary and minor road.
28.0	HERBRUCK (left bank of Pegnitz)	..	SER. Wb (30 t).
28.2		Bridge or culvert over stream.	
30.3	..	Bridge or culvert over stream (Rohr).	Line crosses minor and secondary roads.
31.9	..	..	Line crosses minor road. J (trailing) left with connection from DT a.o. Nürnberg-Eger line (Route 102).
32.3	POMMELBRUNN	..	SER. (less than 7 m. long). Wb (31 t). Line crosses 2 minor roads.
33.6	..	Bridge or culvert over stream.	
36.8	..	..	Line crosses 2 minor roads. Line crosses main road to Amberg.
37.0	HARTMANNSHOF		Line crosses minor road.
38.5	..	Bridge over stream and minor road.	
39.0	..	Ditto	Line curves left. Line crosses minor road. Line curves right and runs NE to Puchwang.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
41.2	..	Bridge or culvert over stream.	Line crosses 3 minor roads.
42.5	ETZELWANG	..	Wb (22 t). Restricted cattle facilities. Line runs mainly in an easterly direction until 6.1.3 km. before reaching Sulzbach-Rosenberg, when it runs S for 0.7 km. and then SE. Line crosses 2 minor roads.
45.1	NEUKIRCHEN (Bei SULZBACH-ROSENBERG)	..	SER. Wb (40 t). Line crosses minor road at station. J (facing) left with ST s.o. line to Weiden (51.5 km.) on the DT s.o. Regensburg-Hof line (Route 107). Line crosses numerous minor roads. Carrying secondary road. Line crosses minor road.
52.9	..	(?) Road overbridge.	Line crosses main road from Nürnberg.
54.5	..	..	Line crosses secondary road.
55.3	SULZBACH-ROSENBERG	..	SER. Wb (30 t). Line crosses 3 minor roads.
57.5	..	Bridge or culvert over stream.	Line crosses 2 minor roads. (?) Sidings S of line.
58.3	SULZBACH-ROSENBERG HÜTTE	..	Line runs E to Altmanshof. Line crosses 3 minor roads.
61.7	ALTMANNSHOF	..	Passenger station. Line runs SE to Amberg. Line crosses 3 minor roads.
63.9	LUTTFOLDHÜTTE	..	J (trailing) left with ST s.o. dead end line from Schnaittenbach (19.6 km.).
65.2	..	(?) Bridge over R. Vils.	Carrying main road from Hahn- bach.
65.3	..	..	Line crosses numerous roads in Amberg.
65.6	..	Road overbridge.	SER. Wb (49 t). Cr (7.5 t). DT section ends.
67.2	AMBERG	..	J (facing) right with ST s.o. dead end line. This branches later and goes to Lauterhofen (27 km.) and Schmidmühlen (22.3 km.). Line crosses minor roads. Line crosses main road.
68.6	..	..	Line curves left and runs NE for a short distance, then curves right and runs ESE until its junction with the Regensburg-Hof line N of Schwandorf. Line crosses 3 minor roads.
71.5	..	Bridge or culvert over stream.	Restricted goods facilities (packages up to 250 kg.). Line runs through the Freilohrer Forest. Line crosses 2 minor roads. Line crosses main road to Schwarzenfeld. Line crosses 1 minor road.
73.8	HILTERSDORF	..	

Km.	Stations	Engineering works	Details and facilities
81.2 *82.9	FRANKLA	..	SER. Wb (30 t). Line crosses numerous minor roads. J (trailing) left with DT s.o. Regensburg-Hof line (Route 107). Line is DT to Km. 94.5, where it branches off the Regensburg line. Line runs south to Schwandorf. Line crosses minor road at station.
89.4 91.4 92.6 *92.9	IRRENLOHE	Bridge or culvert over stream. .. Bridge over R. Naab	Restricted goods facilities. Line crosses main road, from Amberg. Line crosses numerous roads in town.
93.9 94.1 *94.5 95.1	SCHWANDORF	.. .. .. ..	SER. Wb (40 t). Cr. (5 t). ES. Tbl. W. Line runs ESE for c. 1.5 km. Line crosses main road. J (facing) right with DT s.o. line to Regensburg (Route 107). Double track section ends. Beginning of ST. J (facing) right with DE line c. 5 km long. Line runs E for a short distance, crossing several roads and then curves right, passing into the Taxölderner Forest. (The line runs through the Forest as far as Bodenwöhr.) Line crosses 2 minor roads.
100.8	RUNDENSCHELAG	..	Restricted goods facilities (packages up to 500 kg.). Line now runs mainly in a S or SE direction to Bodenwöhr. Line crosses 6 minor roads.
106.4 111.1 112.5 113.3 113.4	ALTENSCHWAND	.. Bridge or culvert over stream. Ditto	SR. Line crosses numerous minor roads. Line crosses minor road. Ditto J (trailing) left with ST s.o. DE line from Rötze (28 km.), (Max. axle load 12.5 t). J (trailing) right with ST s.o. DE line from Nittenau (10.4 km.).
113.8 114.2 116.3	BODENWÖHR	.. Bridge over arm of lake. ..	SER. Wb (32 t). Line runs through the Bodenwöhr Forest. Line crosses minor road. Line runs E on the north side of a lake. Line runs in a mainly ESE direction to Roding. Line crosses minor road. Line crosses main road to Rötze.
118.2 121.3	NEUKIRCHEN-BALBINI	.. Bridge or culvert over stream.	Restricted goods facilities (packages up to 250 kg.). Line crosses 3 minor roads. Line runs through the Neubauer Forest, skirting the NE side of the Rieder lake.

Km.	Stations	Engineering works	Details and facilities
123.3	NEUKAU	..	Wb (30 t). Line crosses 4 minor roads and runs into valley of R. Regen. Line crosses minor road.
127.1	RODING	..	SER. Wb (32 t). Line turns NE and then E to Pöding.
131.6	..	Bridge or culvert over stream (Hiltten).	..
132.9	PÖDING	..	SER. Wb (32 t). Line crosses minor road.
133.5	..	Bridge or culvert over stream.	..
135.1	..	Ditto	Line runs ENE for c. 3 km. Line crosses minor road.
136.8	..	Ditto	..
138.4	..	Ditto	..
140.0	..	..	Line runs SE to Cham.
140.2	..	Ditto	..
140.5	..	..	J (rolling) left with ST s.o. BE line from Waldmünchen.
141.8	CHAM (OBERPF.)	..	Line crosses several minor roads and main road.
*144.7	..	..	J (rolling) right with ST s.o. line which later branches, going to— (a) Straubing (60.9 km.) on the DT s.o. Nürnberg-Passau line (Route 104). (b) Gottenzell (35 km.) on the Plattling-Pilsen line. (c) ST s.o. DT line to Lam (37.3 km.).
144.9	..	..	Line crosses main road to Regen. Line runs in a mainly NE direction to Furth and in the valley of the R. Cham.
148.6	KOTHMÄHLING	..	Line crosses 4 minor roads. SR. Line crosses minor road.
148.9	..	Bridge or culvert over stream.	..
151.1	..	Bridge or culvert over stream (Mühl).	..
152.5	WEIDING	..	Passenger station. Line crosses main road before station.
156.0	ARNSCHWANG	..	SR. Line crosses secondary road.
157.0	..	..	Line crosses main road to Furth. Line crosses minor road.
159.9	..	..	Line crosses main road to Furth.
160.9	FURTH-IM-WALD	..	SER. Wb (40 t). The line crosses the Czechoslovak frontier and continues to Pilsen.

ROUTE 104

NÜRNBERG (HBF)-NEUMARKT-REGENSBURG-PLATTLING-PASSAU

General Description

Provides together with Routes 85 and 90, the direct service from Frankfurt to Austria. The line, which is DT and steam operated throughout, proceeds from Nürnberg in a south-easterly direction through hilly wooded country to Regensburg, whence it runs through the wide Danube basin to Plattling, where the Danube enters hilly country and to avoid difficult gradients the line closely follows the right bank of the Danube to Passau on the Austrian frontier.

The principal junctions are at Nürnberg (see Plan 34), Regensburg (see Plan 36), Plattling with lines S from Landshut and Mühldorf and lines N to Regen and Eisenstein, and at Passau with the line to Linz and Vienna.

Gradients generally speaking will not be difficult, and the most severe will occur between Nürnberg and Regensburg, and Plattling and Passau.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 218.1 km. (135½ miles).
3. TRACK:
 - 0-0 km.-0.7 km., 12 track.
 - 0.7 km.-3.3 km., double track.
 - 3.3 km.-8.0 km., 4 track.
 - 8.0 km.-218.1 km., double track.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 10.3 per mille (1 in 97).

6. MINIMUM RADIUS OF CURVES: 252 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

10.5 km. (6½ miles).
Neumarkt (Oberpf.) 36.0 km.
Deining (Oberpf.) 45.5 km.

9. ENGINE SHEDS:

Nürnberg. Plattling.
Regensburg. Passau.

10. MARSHALLING FACILITIES:

Nürnberg. Regensburg.

11. WATERING FACILITIES: As in 9 above; no other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Marshalling and locomotive facilities given in 9 and 10 above.

(b) Railway workshops at Nürnberg and Regensburg.

(c) Junctions at Nürnberg, Regensburg, Straubing, Plattling and Passau.

(d) Bridges at 1.8, 21.6, 35.4, 48.3, 75.1, 95.0 (over Danube), 125.7, 126.4, 152.6, 167.8 (over Isar) and 190.0 km.

13. CAPACITY:

	<i>Trains per day each way</i>	<i>Net train load tons military stores</i>
(Throughout capacity)	60	500

Distances from Nürnberg

Km.	Stations	Engineering works	Details and facilities
0	Nürnberg Hbf.		Wb (48 t). Cr (20 t). MY. ES. Tbl. Rps. For details of station, see Route 101; and location diagram and photographs, Plans 34, 34a, and 34b. Junction for: (1) DT s.o. line to Würzburg (Route 90). (2) DT line to Treuchtlingen (Route 87). (3) s.o. line to Furth-im-Wald (part DT and part ST) (Route 103). (4) DT electrified lines to Saalfeld. (5) DT s.o. line to Bretten (Route 74). Line runs 12-track to junction at 0.7 km. J (facing) right, with DT s.o. line to Eger (Route 102) and Furth (Route 103). Line runs DT to junction at 3.3 km. Line passes over DT s.o. line to Eger (Route 102), and s.o. line to Furth im-Wald (Route 103). Line runs mainly in an ESE and SE direction to Neumarkt (Oberpf.), running through the Loosener Forest to Burgthann. J (facing) left, with connection from Furth im-Wald (Route 103). Line runs 4-track to Fischbach.
0.7			
1.8		Bridge over railway.	
1.1			

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
3.6	NÜRNBERG	..	SER. Wb (40 t). Cr (15 t).
4.5	DUTZENUTRICH	..	J (facing) right, with DT connection to Mannheim station and Nürnberg MY.
5.7	..	..	J (trailing) right, with ST connection from above.
8.0	FISCHBACH (BEI NÜRNBERG)	..	Restricted goods and cattle facilities. (Packages up to 250 kg.) Line crosses minor road.
8.5	..	Bridge or culvert over stream.	
9.3	..	Bridge or culvert over stream (Langwasser).	Line crosses minor road. Carrying autobahn.
9.4	..	Road overbridge.	Carrying main road.
10.6	..	Road overbridge.	Line crosses minor road.
12.1	..	..	J (trailing) right, with ST s.o. DE line from Wendelstein (5 km.).
12.4	FEUCHT	..	SER. Wb (40 t).
12.8	..	..	J (facing) left, with ST s.o. DE line to Altdorf (11.3 km.).
12.9	..	Road overbridge.	Carrying autobahn.
13.3	..	Bridge or culvert over stream.	Line crosses minor road.
13.5	..	Ditto	Line crosses secondary and minor road.
14.4	..	Road overbridge.	Carrying autobahn.
16.6	OCHSENBRUCK	..	Line crosses minor road.
17.5	..	Bridge or culvert over stream (Schwarzach).	SER. Wb (40 t). Line crosses secondary road.
21.4	BURGMANN	..	Line crosses 3 minor roads.
21.6	..	Bridge over Ludwig Canal.	Line crosses minor road.
22.6	..	..	J (facing) right, with ST s.o. DE line to Allersberg (18.4 km.).
23.2	OBERFERNIEDEN	..	Passenger station. Restricted cattle facilities. Line crosses minor road at station.
24.3	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
25.6	..	Ditto	
26.2	..	Ditto	Line crosses minor road.
26.5	..	Ditto	
26.6	..	Ditto	Line crosses main road to Neumarkt.
27.0	POSTBAUER	..	SER. Wb (32 t).
27.5	..	Road overbridge.	Carrying secondary road. Line crosses 2 minor roads.
30.9	..	Bridge or culvert over stream.	Line curves left and runs ENE for c. 1.5 km., then runs ESE to Neumarkt.
31.4	..	Ditto	
32.6	POLLING	..	Line crosses minor road.
34.0	..	..	Restricted goods and cattle facilities. (Packages up to 250 kg.).
35.1	..	Ditto	Line crosses 2 minor roads.
35.6	..	Bridge over Ludwig Canal.	Line crosses secondary road.

Km.	Stations	Engineering works	Details and facilities
36.0 36.5	NEUMARKT (OBERPF.)	..	SER. Wb (40 t). Cr' (10 t). J (facing) right, with ST s.o. line to Greisselbach (7.0 km.). The line branches at Greisselbach and runs from there— (1) ST s.o. to Freystadt (9.8 km.). (2) ST s.o. Beilngries and Dietfurt (Altmühl) (9.5 km.). From Beilngries there is a ST s.o. line to Eichstätt on the München-Nürnberg line (Route 87). Line runs S through woods to Deining.
36.6	..	Road overbridge.	Carrying main road. Line crosses minor road. Line crosses 4 minor roads.
46.5	DEINING (OBERPF.)	..	SER. Wb (30 t). Line runs E. Line crosses minor road after station.
47.5	..	Bridge or culvert over stream.	
48.3	..	Bridge over R. Laber.	Line crosses secondary and 3 minor roads. Line runs ENE. Line turns SE and runs in that direction to Seubersdorf.
50.0	..	..
51.5	..	..
52.7	RATZHAUSEN	..	Restricted goods facilities. (Packages up to 250 kg.). Line crosses minor road at station. Line crosses 4 minor roads. Line crosses main road to Regensburg.
56.0	..	..
56.5	SEUBERSDORF	..	SER. Wb (32 t). Line runs in a mainly easterly direction to Parsberg. Line crosses numerous small roads.
62.5	..	Road overbridge.	
63.3	..	Road overbridge.	Line crosses secondary road.
63.8	PARSBERG	..	SER. Wb (40 t). Line runs in a mainly SE direction to Deuerling. Line crosses numerous minor roads.
69.8	MAUTHEN	..	Restricted goods facilities. (Packages up to 250 kg.). Line crosses numerous small roads.
74.3	BERATZHAUSEN	..	SER. Wb (40 t). Line crosses minor road.
75.1	..	Bridge over R. Laber.	Line crosses minor road, and curves left.
77.0	..	Road overbridge.	Line runs ENE.
78.1	..	..	Line runs in a mainly SE direction to Undorf. Line crosses minor road.
80.9	LAADER.	..	SER. Wb (32 t). Line crosses 4 small roads.
83.5	DEUERLING	..	Passenger station. Directly after station, carrying main road.
87.3	..	Road overbridge.	Line crosses minor road. Autobahn (marked as projected on map). Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
87.9	UNDORS	..	SER. Wb (32 t). Line runs ENE. Line crosses minor road.
87.2	..	Road overbridge.	Carrying main road to Prerzaburg.
90.6	..	Road overbridge.	Line crosses minor road. Carrying main road to Regensburg.
90.8	ETTERZMAUSEN	..	SER. Wb (30 t). Line runs ESE beside the R. Naab. Line crosses 3 minor roads.
*95.0	..	Bridge over R. Donau (Danube).	Total length, including abutments, c. 400 m. Clear span between abutments c. 360 m. 3 deck lattice girder spans of c. 63 m. (centre to centre piers) on W side over river, with one pier in the water, followed by 6 high, masonry, or concrete arch flood openings of c. 22 m. opening, built in panels of 3, over water, meadows, and roads.
		Railway bridge.	Line runs E to Regensburg. Line crosses 2 minor roads. Line passes over ST s.o. line to Ingolstadt.
*96.8	REGENSBURG-PRÜTZENING	..	SER. J (trailing) left, with ST s.o. line from Ingolstadt (Route 105) (73.9 km.) on the DT Treuchlingen-München line (Route 87). Line crosses numerous roads in Regensburg.
*100.5	REGENSBURG HAR.	..	Passenger and Goods Stations. SER. Wb (40 t). Cr (15 t). Loco Depot: Holding capacity of sheds c. 100 locos (steam), 30 locos (electric). RPS (Locos). Marshalling Yard: Capacity 2,000 wagons per 24 hours. Permanent Way Stores Depot: Area c. 40,000 sq. m. For details and description of Regensburg, see Route 106. For location diagram and photographs, see Plans 36 and 36a.
*102.7	..	..	J (facing) left, with DT s.o. line to Hof (Route 107).
103.2	..	..	J (trailing) left, with DT connection from DT s.o. Hof line (Route 107). Line runs SE to Obertraubling.
103.7	REGENSBURG OST	..	Station for railway personnel only, 2 platforms (island). Line crosses 2 minor roads.
*104.7	..	Bridge or culvert over stream.	
105.1	..	Ditto Line crosses road or possibly now a road overbridge.	Autobahn marked as projected on map.
105.4	BURGWEINTING	..	Wb (40 t). MY. Line crosses minor road.
108.6	OBERTRAUBLING	..	SER. Wb (40 t). Line crosses secondary road.
*109.0	..	..	J (facing) left, with DT connection Regensburg-München line (Route 87).

Km.	Stations	Engineering works	Details and facilities
			Line runs in an ESE or SE direction to Sünching. Line crosses minor road.
110.0	..	Bridge or culvert over stream.	Line crosses minor road.
112.6	MARGOLDING	..	SER. Wb (40 t). Line crosses minor road.
113.6	..	Bridge or culvert over stream.	
114.4	..	Ditto	Line crosses several roads.
117.2	MOOSHAM	..	SER. Wb (40 t). Line crosses 2 minor roads.
118.5	..	Bridge or culvert over stream (Langeneranger).	Line crosses 2 minor roads.
120.5	TÄGERING	..	SER (only 7 m long). Wb (40 t). Line crosses secondary and 2 minor roads.
122.4	..	Bridge or culvert over stream.	Line crosses 2 minor roads and secondary road.
125.2	SÜNCING	..	SER. Wb (40 t). Line crosses minor road.
*125.7 125.9 126.4	..	3 bridges over R. Grosse Laaber and tributaries.	Line crosses minor road and runs E to Radldorf. Line crosses 5 minor roads. J (trailing) right at Radldorf station with ST s.o. line to Neufahrn (Niederbay.) (26.2 km.) on the DT electrified Regensburg-München line (Route 106).
131.7	RADLDORF	..	SER. Wb (40 t). Line crosses secondary road.
*132.6	..	Bridge over R. Kleine Laaber.	Line crosses numerous minor roads.
139.5	..	..	Line turns E to Straubing and crosses 2 roads. J (trailing) right, with short DE spur to (?) prison.
141.3	STRAUBING	..	SER. Wb (40 t). Cr (15 t). Line crosses road.
*141.9	..	..	J (facing) left with ST s.o. line to Cham (63.8 km.) on the Nürnberg-Fürth-im-Wald line (Route 103).
143.0	..	Ditto	Line crosses 3 minor roads.
145.2	..	Ditto	
*145.4	..	Bridge over R. Aiterach.	Line crosses 2 minor roads.
147.3	ANSELING	..	Restricted goods facilities. (Packages up to 250 kg.) Line crosses minor road. Line crosses 2 minor roads.
151.1	NEURACHEN	..	SER. Wb (40 t). Line crosses minor road. Line crosses numerous minor roads.
151.1	..	Ditto	

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
162.1	STEFANSPÖCHING	..	SER. Wb (40 t). Line crosses 2 minor roads. Line crosses main road.
162.4	Line runs SE.
163.4	Line crosses main road. Line crosses 2 minor roads and turns E.
*165.3	J (trailing) right, with DT s.o. line to Pilsting, Landshut, and Mühl- dorf.
165.8	PLATTING	..	SER. Wb (40 t). Cr (5 t). ES. Tbl. W.
*166.4	After station. J (facing) left, with ST s.o. line to Regen. Line crosses minor and secondary roads. Line runs SE.
167.3	..	Bridge or culvert over stream.	
167.7	..	Ditto	
*167.8	..	Bridge over R. Isar.	
168.2	..	Bridge or culvert over stream.	
172.1	..	Road overbridge.	Line crosses 4 minor roads. Carrying main road to Oster- hofen.
172.4	..	Bridge or culvert over stream.	
173.4	..	Ditto	Line runs to Langenisarhofen. Line crosses secondary and minor road.
175.1	LANGENISARHOFEN	..	SER. Wb (40 t). Line runs SE to Girching. Line crosses minor road.
176.1	..	Ditto	Line crosses 3 minor roads and a secondary road.
180.2	..	Ditto	
181.2	OSTERHOFEN (NIEDERBAY.)	..	SER. Wb (40 t). Line crosses minor road.
181.5	..	Ditto	Line crosses 2 minor roads.
184.2	..	Ditto	Line crosses secondary road.
186.6	GIRCHING	..	SER. Wb (31 t). Line runs E to Pleinting. Line crosses minor road.
187.5	..	Ditto	
187.7	..	Ditto	Line crosses minor road.
189.1	..	Ditto	Line crosses minor road.
189.5	..	Ditto	Ditto
189.9	..	Ditto	Ditto
190.1	PLEINTING	..	SER. Line crosses minor road. Line crosses main road.
190.7	Line runs E close to the R. Donau, and between the river and the main road to Vilshofen. Line runs SE to Vilshofen. Line recrosses main road.
192.2	
192.8	
193.8	..	Bridge or culvert over stream.	
195.5	..	Ditto	Line crosses minor road. Ditto
	..	Road overbridge.	Carrying minor road.

Km.	Stations	Engineering works	Details and facilities
*190-0	..	Bridge over R. Vils.	J (trailing) right, with ST s.o. line from Aldenbach (s. 12.5 km.).
194-6	VILMSOVEN (NIEDERBAY.)	..	SER. Wb (40 t). Cr (4 t). Line continues to follow closely the course of the R. Donau and runs ESE.
197-2	..	..	J (facing) right, with ST s.o. line to Ortenburg (10.3 km.).
200-5	..	..	Line crosses main road to Passau and runs between the main road and the R. Donau.
202-6	..	Bridge or culvert over stream.	
203-0	SANDSBACH (NIEDERBAY.)	..	SER. Wb (33 t).
203-6	..	Bridge or culvert over stream.	
205-0	..	Road overbridge.	Carrying main road. Line crosses minor and secondary road.
206-3	SEIBTETTEN	..	Restricted goods facilities. (Packages up to 500 kg.). Line follows the course of the R. Donau to Passau.
207-9	..	..	Line runs E.
209-0	..	..	Line crosses main road to Passau.
211-0	SCHALDUNG	..	SER. Line runs SE.
212-3	..	...	Line crosses main road. Line crosses numerous small roads.
213-4	HEIDING	..	Restricted goods facilities. Line crosses a minor road.
*215-1	..	..	J (trailing) left, with ST s.o. line which crosses the R. Donau to Kalteneck (17.3 km.). At Kalteneck the line divides and runs— (1) ST s.o. (54.1 km. from Kalteneck) to Deggendorf on the ST s.o. Plattling-Regen line; and (2) to Haidmühle on the Czech frontier. Line runs in a mainly easterly direction to Passau. Line crosses minor road.
215-2	..	Bridge or culvert over stream.	
215-3	..	..	Line crosses minor road.
*215-4	..	..	J (trailing) right with ST s.o. line from Pocking (31.4 km.). The line branches at Pocking and runs from there— (1) ST s.o. to Neumarkt-St. Veit (63.1 km.) on the ST s.o. Mühldorf-Landshut line. (2) ST s.o. to Simbach (maximum axle load 12.5 t), where it joins the s.o. Simbach-München line (Route 108). Line crosses minor road. Line crosses main road. Ditto
216-7	..	..
*218-1	PASSAU Hbf.	..	SER. -Wb (60 t). Cr (15 t). ES. TM. W. Line continues DF s.o. across the old Austrian-German frontier to Wels, Linz, and Vienna.

RAILWAYS

ROUTE 109

INGOLSTADT (MAIN STATION)-REGENSBURG HBF

General Description

This line connects the DT München-Treuchtlingen (Route 87) with the DT s.o. Nürnberg-Passau line (Route 104). The line is steam operated throughout and ST except for 3.7 km. from Regensburg-Prüfening to Regensburg which is DT.

The line runs SSE from Ingolstadt for a short distance, then E to Manching, and for the rest of the way in a mainly NE direction to Regensburg.

There are no steep gradients.

The line follows the valley of the R. Donau (Danube); from Saal to Regensburg it follows it very closely with many curves.

There are 2 bridges across the R. Donau at 56.2 and 68.4 km.

Principal junctions are Ingolstadt for the ST s.o. line to Augsburg (Route 88) and the DT München-Treuchtlingen line (Route 87), Regensburg for the DT s.o. Nürnberg-Passau line (Route 104), the DT s.o. line to Hof (Route 107) and the DT electrified line to München (Route 106).

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.

2. LENGTH: 73.9 km. (45½ miles).

3. TRACK:

Ingolstadt-Regensburg-Prüfening, single.
Regensburg-Prüfening-Regensburg, double.

4. MAXIMUM PERMISSIBLE AXLE LOAD:

Ingolstadt-Regensburg-Prüfening, 18 metric tons.

Regensburg-Prüfening-Regensburg Hbf,
20 metric tons.

5. MAXIMUM GRADIENT: 10 per mille (1 in 100).

6. MINIMUM RADIUS OF CURVES: 200 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

7.4 km. (4½ miles).

Münchsmünster, 20.2 km.-Neustadt (Donau),
27.6 km.

9. ENGINE SHEDS:

Ingolstadt.

Regensburg.

10. MARSHALLING FACILITIES: Regensburg.

11. WATERING FACILITIES: As in 9 above.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Locomotive and marshalling facilities at Ingolstadt and Regensburg.

(b) Junctions at Ingolstadt and Regensburg.

(c) Railway workshops at Ingolstadt and Regensburg.

(d) Bridges over Danube on Route 87 and at 5.7, 8.9, 14.6 (over Danube) and at 68.4 km. (over Danube).

13. CAPACITY:

Trains per day Net train load tons
each way military stores

(Throughput capacity) 16

400

Distance from Ingolstadt

Km.	Stations	Engineering works	Details and facilities
0	INGOLSTADT		<p>Passenger Station. 3 platforms (2 island), c. 300 m. long—at least 4 through tracks.</p> <p>Goods Station. W of passenger station. SER. Wb (40 t). Cr (20 t). Warehouse facilities and also facilities for direct loading and unloading to and from road vehicle.</p> <p>Shunt Yard. E of passenger station. Reception sidings, c. 4 LS (c. 600 m. each). Departure sidings, c. 4 LS (c. 600 m. each). Marshalling sidings, c. 8 LS (c. 600 m. each). Sorting sidings, c. 8 LS (c. 250 m. each). Loco. Depot. E of shunt yard. 2 ES (RH), holding capacity 20-25 each. Workshops attached. 2 Tbl (c. 16 and 22 m.). W. Steam Station. Loco. and Carriage and Wagon—total employed c. 1,400 persons—such extensive work served by connection from small group of loco shed on N. Railway.</p>

Km.	Stations	Engineering works	Details and facilities
			Turntable in yard 6. 22 m. diameter. For air photograph, see Appendix 2, Report 6/377.
			Approach to Ingolstadt from the N is via Route 87, entailing a bridge over the Danube.
			Line crosses minor road.
1-2	..	..	J (facing) right, with ST s.o. line to Augsburg (Route 88) and with DT line. München-Treuchilingen (Route 87).
			Line runs E to Manching.
			Line crosses minor and secondary road.
3-6	..	Road overbridge.	Carrying autobahn.
			Line crosses minor road.
5-7	..	Bridge over R. Paar.	Line crosses secondary road.
7-2	MANCHING	..	SER. Wb (32 t).
			Line runs in an ENE or NE direction to Ahrensberg.
			Line crosses minor road.
8-9	..	Bridge or culvert over R. A.h.	Line crosses minor road.
10-8	..	Bridge or culvert over stream.	
11-4	ERNSTADEN	..	Passenger station.
			Line crosses secondary road after station.
12-2	..	Bridge or culvert over stream (Moos).	
13-0	..	Bridge or culvert over stream.	Line crosses minor and secondary road.
14-0	VOHSTRO	..	SER. Wb (40 t).
14-6	..	Bridge over R. Ilm.	
14-8	..	Bridge or culvert over stream.	Line crosses minor roads.
15-7	..	Ditto	
16-0	..	Ditto	Line crosses 3 minor roads.
19-6	..	..	Line crosses main road to Regensburg.
20-2	MÜNCHENMÜNSTER	..	SER. Wb (31 t).
21-0	..	..	Line crosses main road.
			Line crosses minor road.
27-6	NEUSTADT (DONAU)	..	SER. Wb (40 t).
27-8	..	..	Line crosses main road.
28-2	..	Bridge or culvert over stream.	
29-0	..	Ditto	Line crosses main road.
29-2	..	Ditto	
30-5	..	Ditto	Line crosses minor road.
32-2	..	Ditto	Line crosses minor road.
33-0	..	Ditto	Line crosses minor and secondary road.
34-1	ANNOBERG	..	SER. Wb (40 t).
34-3	..	..	Line runs ENE.
34-3	..	..	Line crosses minor road.
34-3	..	..	Line runs ENE.

Km.	Stations	Engineering works	Details and facilities
37-1	ARNHOFEN	..	Restricted goods facilities. (Packages up to 250 kg.) Line runs N and then SNW to Thaldorf-Weltenburg. Line crosses minor road. Carrying main road to Regens- burg. Line crosses several minor roads.
37-8	..	Road overbridge.	
41-7	..	Bridge or culvert over stream (Hopfen).	
41-9	..	Road overbridge.	Carrying minor road..
42-2	THALDORF-WELTENBURG	..	SR.
42-5	..	Bridge or culvert over stream (Hopfen).	
44-3	..	Bridge or culvert over stream (Hopfen).	Line curves sharply right and crosses minor road.
45-2	..	Ditto	Line crosses minor road.
45-6	..	Ditto	
47-0	..	..	Line runs NE.
47-3	..	Ditto	Line crosses main road.
48-4	..	..	Line crosses secondary road. J (trailing) left, with ST s.o. line from Kelheim (s. 4-6 km.). Line runs E to station.
49-2	SAAL (DONAU)	..	SER. Wb (40 t). Line now has many curves and closely follows the course of the R. Donau (Danube), crossing it twice.
49-5	..	Road overbridge.	Carrying main road.
49-8	..	Bridge or culvert over stream.	
50-1	..	..	Line crosses minor road. Line crosses main road.
54-9	BAD ABBACH	..	SER. Wb (32 t). Line crosses minor road at station. Line crosses minor road.
56-2	..	Bridge over R. Donau.	Line crosses minor road. Line curves left and crosses minor road.
58-8	GUNDELSHAUSEN	..	SER. Wb (30 t). Line crosses 3 roads curving sharply right.
61-8	MATTING AUSWEICHE	..	Station for railway personnel.
62-6	MATTING	..	Passenger station. Line curves left crossing 2 minor roads before Sinzing. J (trailing) left at Sinzing station with ST s.o. DE line from Alling (4-1 km.).
67-7	SINZING	..	SER. Wb (30 t). It is possible that there is an auto- bahn between Sinzing and Re- gensburg carried over the line by a road overbridge. (Marked as under construction on map.) There are 3 passenger halts be- tween Sinzing and Regensburg: Putenzen called Kleinputzenzen, Regensburg-Pfingsttief and Regensburg-Schutzenheim.

Km.	Stations	Engineering works	Details and facilities
068.4	..	Bridge over R. Dnau.	Line crosses secondary road.
69.4	..	Fly-over.	Line passes under DT s.o. line from Nürnberg (Route 104).
70.2	REGENSBURG-PRÜFENING	..	SER. J (trailing) right at Regensburg-Prüfening station with DT s.o. line from Nürnberg (Route 104). Line crosses secondary road after halt. Line crosses minor road. Line crosses roads in Regensburg.
73.9	REGENSBURG Hbf.	..	MY (at Jurgweinting). ES. Tbl. Rps. SER. Wb (40 t). Cr (15 t). (For station details, see Route 106.) J with DT s.o. lines to Passau (Route 104) and Hof (Route 107). DT electrified line to München (Route 106).

ROUTE 106

MÜNCHEN HBF-LANDSHUT-REGENSBURG

General Description

Forming, together with Route 107, part of the main line from München to Leipzig and Berlin, the line first runs W from München, and branches away from the main lines to Stuttgart and Nürnberg to run NE along the wide valley of the R. Isar to Landshut, where it turns N to cross rising country and several minor river valleys, into the Danube basin, to Regensburg.

The principal junctions are at München with the lines to Stuttgart (Route 82), Treuchtlingen to Nürnberg (Route 87), Innsbruck (Route 122), Buchloe and Kempten (Route 119), Rosenheim, Salzburg and Innsbruck (Route 123); at Landshut with ST lines NE to Plattling, Eisenstein and Pilsen, and SE to Mühldorf, and at Regensburg where electric traction terminates, with main s.o. lines Nürnberg to Passau (Route 104), and Regensburg-Eger-Hof-Leipzig, Berlin (Route 107), and the ST line to Ingolstadt (Route 105).

Regensburg and München are 2 of the 3 most important railway centres in Bavaria, the third being Nürnberg, and both places are well equipped with marshalling and locomotive facilities, as well as railway workshops.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 138.2 km. (85½ miles).
3. TRACK: Double.

Distance from München

Km.	Stations	Engineering works	Details and facilities
0	MÜNCHEN Hbf	..	SER. Wb (30 t), Cr (15 t) MY (Passing) capacity 2,000 wagons per 24 hrs. ES (Rt) 1000, holding capacity 2,100. Tbl. 20.

4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 10 per mille (1 in 100).
6. MINIMUM RADIUS OF CURVES: 400 m.
7. TRACTION: Electric.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 9.9 km. (6½ miles).
München Hbf-München-Moosach.
9. ENGINE SHEDS:
München-Pasing. Landshut.
München Ost. Regensburg.
10. MARSHALLING FACILITIES:
München-Pasing. Regensburg.
München Ost.
11. WATERING FACILITIES: As in 9 above.
12. VULNERABLE POINTS: Marked with asterisk in text.
(a) Locomotive and marshalling given in 9 and 10 above.
(b) Railway workshops at München and Regensburg.
(c) Junctions at München, Landshut, Neufahrn, Ober-Traubling and Regensburg.
(d) Bridges at 2.2, 3.4, 17.5, 18.6, 59.9, 114.6, 126.8 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Electric traction	96	600
Steam traction	72	500

Km.	Stations	Engineering works	Details and facilities
			RPS. Locomotive, and carriage and wagon. Goods station. For details of facilities see Routes 122 and 123. For location diagrams and air photographs of München see Plans 32-324, and Photograph 11.
*1.6	..	..	J (facing) left with DT s.o. line to Holzkirchen and Rosenheim (Route 123), Augsburg and Stuttgart (Route 82), Büchloe (Route 119), and Innsbrück (Route 122).
*2.2	..	Railway bridge.	Line passes over line from Holzkirchen and Rosenheim (Route 123).
*5.4	..	2 fly-overs.	Line passes under— (1) DT electrified line to Augsburg (Route 82). (2) DT s.o. line to Büchloe (Route 119). (3) s.o. line to Herrsching. (4) Electrified line to Innsbrück (Route 122). (This line is 4 track leaving München, then DT to Tutzing, and ST from Tutzing to Innsbrück).
*6.6	..	..	J (facing) left with electrified line to Treuchtlingen and Nürnberg (Route 8). Line is 3 track to Moosach.
9.9	MÜNCHEN-MOOSACH	..	SER. Wb (40 t). Line follows the valley of the R. Isar to Landshut, running in a NNE or NE direction. Line crosses several roads.
10.9	..	..	J (facing) right with connection to ST, electrified line from München Ost Pbf. to Ismaning. Line crosses secondary road.
12.2	MÜNCHEN-PASCANERIE	..	Passenger halt. Line crosses minor and secondary road.
13.9	..	..	J (trailing) right with dead end spur from Oberwiesensfeld airport. Line crosses minor road.
14.6	MÜNCHEN-FELDMOCHING	..	SER. Wb (30 t). Line crosses minor and secondary road. Narrow gauge spur c. 4.5 km. long E. of the line.
*17.5	..	Bridge over Wurm canal.	
18.6	SCHLEISHEIM	Bridge over Schleisheimer canal.	SER. Wb (40 t). Immediately after station. Line crosses 4 minor roads. Line crosses main road by station.
23.5	FORNBERG	..	SER. Wb (30 t).
26.4	PEIHING	..	Restricted goods and cattle facilities. (Packages up to 250 kg.). Line crosses secondary road immediately after station. Curve 1.5 km. between PeiHING and N. station.
		Road crossings.	

Km.	Stations	Engineering works	Details and facilities
30.4	NEUFARN (NBI FREISING)	..	SER. Wb (40 t). 1 for narrow gauge spur c. 3.5 km. long. Line crosses minor road.
31.6	..	Bridge or culvert over stream (Galggen).	Line crosses 3 minor roads.
35.2	PULLING (NBI FREISING)	..	Passenger Station. Restricted cattle facilities. Line crosses 2 minor roads.
39.1	..	Bridge or culvert over stream.	
39.5	..	Ditto	
40.0	..	..	Line crosses main road to Land- shut.
40.7	FREISING	..	SER. Wb (40 t). Cr. (10 t).
41.4	..	..	Line passes over or under small road.
42.5	FREISING-NEUTIFT	..	Passenger halt.
	..	Ditto	Just before Marzling station.
45.0	MARZLING	..	Restricted goods and cattle facili- ties. (Packages up to 250 kg.). Line crosses 2 minor roads.
49.8	..	..	Line crosses main road.
50.4	LANGENBACH (OBERBAY.)	..	SER. Wb (30 t). Line crosses minor road after station.
50.9	..	..	J (facing) left with ST s.o. line to Wolnzach Bhf. (44.5 km.). (Max. axle load from Unterzolling to Enzelhausen is 12.5 t). Woln- zach Bhf. is on the München- Treuchtlingen DT line. (Route 87). Line crosses 4 roads.
57.5	MOOSBURG	..	SER. Wb (40 t). Line crosses 2 roads.
59.9	..	Bridge over R. Amper.	Line crosses 3 minor roads.
64.8	..	Bridge or culvert over stream.	
65.1	BRUCKBERG	..	SER. Wb (40 t). By station.
		Bridge or culvert over stream.	Line crosses small road immedi- ately after station.
67.2	..	Ditto	
67.8	..	Bridge or culvert over stream (Oster).	Line crosses minor road before station.
67.9	GENDEKOFEN	..	Passenger station.
68.3	..	Bridge or culvert over stream.	
68.7	..	Ditto	
69.8	..	Ditto	Line crosses minor road.
71.5	..	Ditto	Line crosses minor road.
72.4	..	Ditto	
73.9	..	Ditto	
74.7	..	..	J trailing left, with ST s.o. DE line from Rottenburg (c. 27 km.).
75.1	..	Ditto	J trailing right, coming into station, with ST s.o. line from Neumarkt-St. Veit

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
76.1	LANZSHUT (BAY.) Hbf.	..	SER. Wb (40 t). Cr (10 t). ES. W. Line runs in a mainly N and NNE direction to Neufahrn and leaves the valley of the R. Isar. Carrying-main road.
76.7	..	Road overbridge.	
77.0	..	Bridge or culvert over stream.	
77.9	..	Ditto	J (facing) right, with ST s.o. line to Pilsing.
78.0	..	..	Line crosses minor road.
80.2	ERGOLDING	..	Restricted goods facilities. (Pack- ages up to 250 kg.). Line crosses minor road.
80.8	..	Ditto	Line crosses 2 small roads.
83.0	..	Ditto	Line crosses minor road. Line crosses minor road.
84.1	MIRSROFEN	..	SER. Line crosses several small roads.
91.0	KLÄMM	..	Restricted goods facilities. Line crosses minor road.
91.5	..	Ditto	Line crosses 3 minor roads.
95.1	ERGOLDSBACH	..	Line crosses minor road at station. Line crosses road 3 times.
99.3	NEUFARN (NIEDERBAY.)	..	SER. Wb (40 t).
99.7	..	Ditto	Line crosses 2 minor roads. Line crosses main road.
101.0	..	..	J (facing) right with ST s.o. line to Radldorf (23.2 km.) on the DT s.o. Nürnberg-Passau line (Route 104).
102.3	..	..
102.8	..	Ditto	Line crosses minor road.
104.1	STEINRAIN	..	SER. Wb. (32 t).
105.1	..	..	Line crosses main road.
105.3	..	Bridge or culvert over stream (Hasel).	Line crosses 2 minor roads. Line crosses 2 minor roads.
108.7	..	Bridge or culvert over stream (Deggenbacher).	Line crosses main road to Regens- burg.
108.7	..	..	Line crosses several minor roads.
112.9	..	..	J (trailing) left with ST s.o. DE line from Langquaid (9.7 km.). Line crosses main road.
113.3	EGGMÜHL	..	SER. Wb (40 t).
114.6	..	Bridge over R. Grosse Laaber.	Line crosses minor road.
115.9	..	Bridge or culvert over stream.	Line crosses main road.
117.9	..	..	Line crosses minor road.
120.0	..	..	Line crosses main road. Line crosses secondary road.
121.3	HAGELSTADT	..	SER. Wb (30 t).
121.3	..	Ditto	Line crosses 4 minor roads.
121.3	..	..	Line crosses minor road.

MÜNCHEN HBE TO REGENSBURG

71

Km.	Stations	Engineering works	Details and facilities
125.5	KÖPPLING	..	SER. Wb (40 t). Line runs NNW to c. 2 km. from Regensburg. Line crosses 2 small roads.
*126.8	..	Bridge over R. Pfetter.	Line crosses minor road.
127.7	..	Bridge or culvert over stream.	Line crosses 2 small roads.
*130.1	..	..	J (trailing) right, with DT s.o. line from Passau (Route 104). Line crosses secondary road.
130.4	OBERTRAUBLING	..	SER. Wb (40 t). Line crosses minor road.
*133.5	BURGWEINTING	..	Wb (40 t). MT (capacity 2,000 wagons per 24 hours), c. 2 km. N of Burg- weinting station. Loco. Depot at N end of yard in J triangle with Eger line— small ES (rectangular) for ac- commodating yard locos. Tb1 (c. 30 m.). W.
133.8	..	Bridge or culvert over stream.	
134.2	..	Ditto	Line crosses 2 minor roads.
135.0	REGENSBURG OTT	..	Station for railway personnel only adjacent to and W of MY. 2 island platforms c. 300-400 m. long.
*135.5	..	..	J (facing) right, with DT s.o. line to Hof (Route 107). Line runs W to station and crosses roads in town.
*136.0	..	..	J (trailing) right with connection from Route 107 and also connec- tion from docks exchange sidings. J (trailing) connection right, with private sidings to gas works— comprising 5 LS c. 300 m. long with connections to works.
*138.2	REGENSBURG	..	Passenger Station: 2 island platforms 300-350 m. long and 1 single- faced platform c. 300 m. long— c. 8 through tracks. Goods Station: N. of line and W of passenger station. SER, Wb (40 t), Cr (15 t), about 5 large warehouse sheds, the principal one served by c. 12 DES 150-200 m. long with con- nection at W end to MY at Regensburg Hbf. c. 6 DES (c. 200 m. long), with road access—2 DES serving ramp. Marshalling Yard: Separate yard from that at Burgweinting. Reception or Departure Sidings (E end): 6 LS up to 800 m. long. Marshalling Sidings: 12 LS, 510- 800 m. Reception or Departure Sidings (W end): 6 LS c. 400 m. long, 10 LS c. 350-800 m., with connection W end to Messer- schmitt Works. Storage Sidings N of yard and sidings: 12 LS c. 100 m. each (c. 100 m.).

Km.	Stations	Engineering works	Details and facilities
			<p>N of goods yard: 2 groups of DES; 10 x 300-450 m., and 16 of average length c. 550 m.</p> <p>Permanent Way Stores Depot: N of last-named group of 16 DES is a large quadrilateral area used for the storage of permanent way materials, with several sets of through tracks—area c. 40,000 sq. metres.</p> <p>Locomotive Depots: 3 ES, RH type, S of line immediately opposite passenger station, each capable of accommodating 20-25 locos.</p> <p>3 Tbls (c. 20, 25, 16 m. diameter)—large RpS adjacent.</p> <p>W of this group of ES lies a further RH with Tbl (25 m.) capable of taking larger locomotives than the others—capacity 20-25.</p> <p>E of this RH, an ES (rectangular) with c. 10 tracks, dimensions 100 x 75 m., for electric locomotives only—capacity c. 30 locomotives.</p> <p>Total holding capacity of depots c. 100 steam locomotives and 30 electric locomotives.</p> <p>Docks Sidings: Connections from line Regensburg-Schwandorf at E end of passenger station.</p> <p>Exchange Sidings: 16 LS 300-450 m. In addition several groups of sidings adjacent to docks and dockside installations for holding purposes.</p> <p>For location diagram of Regensburg see Plan 36 and air photograph 36a.</p>

ROUTE 107

REGENSBURG HBF-SCHWANDORF-IRRENLOHE-WEIDEN-WIESAU-MARKTREDWITZ-OBERKOTZAU-HOF

General Description

Connecting with Route 104 from Passau, Route 103 from Ingolstadt, and Route 106 from München, this line provides the main-line service for traffic from those places to Dresden, Leipzig and Berlin, although so far as Ingolstadt is concerned a through DT main line via Nürnberg (Route 87) provides a more direct route.

From Regensburg, the line branches N at the junction with Route 106 at 2.2 km. and, after crossing the Danube, proceeds along the Regen valley to Regensburg, where it crosses slightly hilly country to the valley of the R. Naab at Klardorf and follows the valley to Reuth near the source of the river, to continue thence for the rest of the journey through mountainous country, joining Route 102 at Marktredwitz.

The most difficult gradients will be experienced between Regensburg (1:1 km.) and Lohmütz (33.1 km.) and from Weiden (80.6 km.) to Hof.

Important junctions are at Regensburg (see Plan 36), at Schwandorf and Irrenlohe with Route 101 (Nürnberg-Fürth), at Weiden with the ST line to Kirchleibach on Route 102, at Wiesau with the ST line to Feer, at Marktredwitz with Route 102 (Nürnberg-Feer) and at Oberkotzau with the main line from Nürnberg (Route 101) and also the ST line from Feer.

Of the many bridges over rivers, several of which are not inconsiderable, the following details of the bridge over the Danube at 3.6 km. taken from air cover, are worth noting:

Flood opening on North approach:

Total length including abutments c. 103 m., with clear span between abutments of c. 83 m., composed of 5 spans of c. 17 m. (centre to centre piers) which are probably masonry arches.

The flood opening is followed by c. 135 m. of high, earth embankments, succeeded by a viaduct c. 612 m. long, crossing the R. Danube and low land on both sides of it, and the entrance to a dock. This viaduct is as follows:

Viaduct (North bank):

3 masonry or concrete arches of c. 11 m. opening.

Over R. Danube: 5 lattice girder through spans c. 51 m. long (centre to centre piers) (2 piers in river).

Viaduct (South bank) (see Plan 36):

12 masonry or concrete arches of c. 17 m. spans (centre to centre piers).

Over dock entrance: one skew, through, lattice girder span of c. 17 m. clear span.

The whole viaduct carries DT.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in). Standard.
2. LENGTH: 179.2 km. (111½ miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 19 per mille (1 in 100).
6. MINIMUM RADIUS OF CURVES: 400 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS:
10.4 km. (6½ miles).
Reith 109.5 km. - Wiesau 119.9 km.
9. ENGINE SHEDS:
Regensburg. Schwandorf. Wiesau.
10. MARSHALLING FACILITIES:
Regensburg. Hof (Oberkotzau).
11. WEEDING FACILITIES: As in 9 above. No other details.
12. VULNERABLE POINTS: Marked with asterisk in text.
(a) Marshalling and locomotive facilities given in 9 and 10 above.
(b) Junctions at Regensburg, Schwandorf, Irrenlohe, Weiden, Wiesau, Markttredwitz and Oberkotzau.
(c) Bridges at 3.6 (over Danube), 15.5 (over Regen), 43.2 (over Naab), 50.3, 57.1, and 57.7, 79.3, 98.9, 102.6, 101.2, 103.1-104.5, 139.7, 155.6, 170.2 Km., and 176.8, and also bridge over Saale, N of Hof station (see Photograph 26).
13. CAPACITY:
Trains per day Net train load tons.
each way military stores
(Throughout capacity) 60 500

Distance from Regensburg

Km.	Stations	Engineering works	Details and facilities
138.2	MÜNCHEN	Route 106.	
130.5	NÜRNBERG	Route 104.	
*0	REGENSBURG HBF.	..	Permanent Way Store Depot. MV. ES. Tbl. RpS. SER. Wb (40 t). Cr (15 t). For details of station, see Route 106, and for location diagram and air photograph, Plans 36 and 36a. J (facing) right, with DT electric line to München (Route 106). J (facing) left, with industrial siding. Line crosses main road. J (trailing) right, with connection from Route 106.
*2.2	..	..
*3.2	..	..
		Bridge over industrial sidings.	
*3.6	..	Viaduct over R. Donau (Danube) and basin.	Line runs in a mainly N direction to Wiesau. Total length c. 612 m., with flood opening c. 103 m. See further in General Description of route. Line crosses 2 small roads before reaching next station.
		Bridge over siding.	J (trailing) left, with siding from stores depot, see Plan 36. J (trailing) right, with industrial sidings. J (trailing) left, with sidings from stores depot, see Plan 36.
4.3	REGENSBURG-WALHALLSTRASSE	..	SER. Wb (40 t). J (trailing) right, with industrial sidings, see Plan 36. Line crosses 3 small roads.
7.3	REGENSBURG-WUTZHOFFEN	..	SER. Wb (40 t).
8.1	..	..	Line crosses minor road. J (facing) right, with ST s.o. line to Falkenstein (Oberkotzau) 11.7 km.). Line crosses 2 minor roads.
9.8	..	Bridge or culvert over stream.	Line crosses 2 minor roads.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
11.2	REGENSDORF		Passenger halt. Line crosses main road to Burglengenfeld immediately after halt. Line crosses 3 minor roads. SER. Wb (40 t). Line runs NNW.
15.1	REGENSTAUF		
*15.5	..	Bridge over R. Regen.	Line crosses 2 small roads.
18.6	..	Bridge or culvert over stream.	Line crosses minor road. Line turns W and then through woods, crosses minor road, then curves sharply right and runs NNE to Ponholz, crossing a minor road.
23.9	..	Road overbridge.	Carrying main road to Burglengenfeld.
24.0	PONHOLZ		SER. Wb (32 t). Line crosses numerous small roads.
27.2	HAIDHOF		SER. J (facing) left at station with ST s.o. line to Burglengenfeld (6.9 km.). Line crosses minor road.
28.4	..	Bridge or culvert over stream.	Line runs through woods to Klardorf. Line crosses minor road.
29.6	..	Ditto Road overbridge.	Carrying small road by station.
33.1	LOHNITZ		Passenger station. Line runs NNW to Schwandorf. Line crosses 2 minor roads.
35.2 35.8	..	Bridges or culverts over streams.	
36.1	KLARDORF		SER. Wb (30 t). Line runs in the valley of the R. Naab to Lube-Wildenau. Line crosses minor road.
37.3	..	Bridge or culvert over stream.	Line crosses minor road.
38.7	..	Ditto	Line crosses minor road.
39.5	..	Ditto	Line crosses minor road.
40.2	..	Fly-over.	Line passes over or under DE spur running from E of line towards R. Naab. Line crosses minor road.
*41.8	..		J (trailing) right, with s.o. line from Cham (ST section of Route 103). Line crosses roads in town.
*42.6	SCHWANDORF		SER. Wb (40 t). Cr (5 t). FS. Tbl. W.
*43.2 43.6 44.9	..	Bridge over R. Naab. Bridge or culvert over stream.	Line crosses main road. Line crosses minor road by station.
46.9	IRRENLOHE		SER (only 7 m. long). Line crosses minor road of station.
*47.5	..		J (facing) left, with s.o. line to Amberg (ST section of Route 103).
48.1	..	Ditto	Line crosses minor road.
50.3 50.4	..	Road overbridge.	Carrying main road. W of line, private siding to mine, 2.3 km. long.

Km.	Stations	Engineering works	Details and facilities
50.9	SCHWABENBRUNNEN	..	SER. Wb (45 t). Line crosses minor road and runs NNE to Nabburg. Carrying main road to Nabburg.
51.4	..	Road overbridge.	Line crosses 2 minor roads.
53.0	..	Bridges or culverts over streams.	Line passes over or under ST s.o. DE line from Schönes.
53.1	..	..	J (trailing) left, with above line from Schönes (43.9 km.) (Max. axle load from Winklarn to Schönes 12.5 t).
54.6	..	Fly-over.	J (trailing) left with DE spur c. 1.5 km. long.
55.0	..	..	J (trailing) left with connection from above spur.
55.3	..	..	..
55.9	..	..	..
56.3	..	Bridge over R. Naab.	..
57.1	..	Ditto	..
57.7	..	Ditto	..
58.3	NABBURG	..	SER. Wb (40 t). Line crosses road.
59.0	..	Bridge or culvert over stream.	Line runs NNW to Pfreimd. Line crosses several main roads.
62.5	..	Bridge or culvert or stream.	..
62.8	PFREIMD	..	SER. Wb (32 t). Line crosses minor road.
63.0	..	Ditto	Line crosses minor road.
68.8	..	..	Line crosses main road from Wern- berg to Hirschau.
69.5	WERNBERG	..	SER. Wb (40 t). Line runs NNW.
70.0	..	Ditto	Line crosses minor road.
71.1	..	Ditto (Ehen)	Line curves right and turns NE
71.5	..	Ditto	Line curves left and runs NNW to Luhe-Wildenau.
72.0	..	..	..
74.3	..	..	..
75.7	LUHE	..	Restricted goods facilities. (Packages up to 250 kg.) Line crosses minor road immedi- ately after station. Line crosses minor road just before Luhe-Wildenau station.
78.1	LUHE-WILDENAU	..	SER. Wb (32 t). Line crosses minor road immedi- ately after station. Line follows valley of R. Waldnaab.
79.3	..	Bridge over R. Heidenab.	Line crosses minor road.
81.5	ROTHENSTADT	..	Restricted goods facilities. (Packages up to 250 kg.) Line crosses 2 small roads.
83.3	..	..	J (trailing) left with ST s.o. line from Neukirchen-Sulzbach-Rosen- berg (c. 48.5 km.) on the s.o. line Nürnberg to Amberg (DT section of Route 10 p.).
84.0	..	..	Line runs NNE to Weiden. Line crosses minor road. Line crosses main road. Line crosses minor road.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
86.6	WEIßHORN (ONERPP.)	..	SER. Wb (42 t. Cr (10 t). Rps (loco and goods wagon, total staff, 1,131). Line crosses road.
87.4	..	Bridge or culvert over stream.	J (facing) left, with ST s.o. line to Kirchenlaibach (38.4 km.) on the Nürnberg-Eger line (Route 102).
*87.5
87.6	..	Ditto	Line crosses 2 small roads.
88.3	..	Ditto	Ditto
88.6	..	Ditto	..
88.7	..	Ditto	Line crosses main road to Windisch- schenbach.
89.4	Line runs through woods to Neu- stadt (Waldnaab) and crosses 2 minor roads.
92.2	J (facing) right, with ST s.o. line to Floss (c. 9.4 km.), where the line divides running to Ewar- n, 38.4 km. from Floss, and Floss-n- burg, 6.2 km. from Floss.
92.7	NEUSTADT (WALDNAAB)	..	SER. Wb (40 t). Line crosses 2 minor roads.
94.3)	..	Bridges or culverts over	..
95.1)	..	streams.	..
95.7)	Line curves right and then left following the course of the R. Waldnaab.
97.4	..	Bridge or culvert over	..
97.9	..	stream.	Ditto
98.4	LAMPLMÜHLE	..	Restricted goods facilities. (Packages up to 250 kg.)
*98.9	..	Bridge over R. Waldnaab.	Line crosses minor road.
99.6	..	Bridge or culvert over	..
*100.6	..	stream.	..
*101.2	..	Bridge over R. Waldnaab.	Ditto
102.0	WINDISCHSCHENBACH	..	SER. Wb (40 t). Line crosses minor road at station.
102.5	..	Bridge or culvert over	..
103.1	..	stream.	Line crosses minor road.
*103.3	..	Bridge over R. Waldnaab.	..
*104.3	..	Ditto	Line leaves valley of R. Waldnaab.
*104.3	..	Bridge over R. Fichtelnaab.	Line crosses 2 minor roads.
*104.3	..	Ditto	..
105.2	..	Bridge or culvert over	..
107.8	..	stream.	Line crosses 2 minor roads.
108.3	..	Bridge or culvert over	..
108.3	..	stream (Hein).	Line crosses minor road.
109.5	REUTH (OPE FRÜHERNORF)	..	J (trailing) left, with ST s.o. DE line from Erberndorf Nord (3.5 km.).
110.2	..	Ditto (Hein)	SER. Wb (40 t). I for narrow gauge spur W of line c. 6 km. long. Line crosses secondary road.
111.1	..	Ditto (R. Sch.)	Line turns NE. Line crosses minor road.

Km.	Station	Engineering works	Details and facilities
111.9	Line turns E. Line crosses minor road.
112.3	..	Bridge or culvert over stream (Roth).	..
112.8	Line runs NNE to Wiesau. Line crosses minor road.
114.9	..	Bridge or culvert over stream.	Line crosses minor road.
115.7	..	Ditto	..
116.0	..	Ditto	Line crosses minor road.
117.7	..	Ditto	Line crosses minor road.
118.2	..	Ditto	Line crosses secondary road. J (trailing) right.
119.4
*119.9	WIESAU (OBERPF.)	..	SER. Wb (40 t). ES. Tbl. W. I for short narrow gauge spur with 2 branches W of line. Line crosses minor road. Line crosses minor road. J (facing) right, with ST s.o. line to Eger (24.5 km.). Line runs NNW. Line crosses 2 minor roads. Carrying main road from Mitterteich to Marktredwitz. Line turns NW. Line crosses main road. Line runs W to station.
120.7	..	Bridge over R. Wiesau.	..
*121.9
125.7	..	Road overbridge.	..
127.3
128.0	GROSCHLATTENBRUNN	..	SER. Wb (31 t). Line crosses numerous minor roads. Line curves sharply left and runs SW. Line crosses minor road. Line curves sharply right and runs NW and then N to Eger line (Route 102). J (trailing) left, with DT s.o. line from Schnabelwald (DT section of Nürnberg-Eger line, Route 102). Line crosses road in town.
133.9
135.8
137.2
137.7	MARKTREDWITZ	..	SER. Wb (40 t). Cr (17.5 t). J (facing) right, with ST s.o. line to Eger (ST section of Nürnberg-Eger line, Route 102). Line crosses minor road and runs NNW.
*138.2
*139.7	..	Bridge over road and over R. Röslau.	..
140.6	Line turns W. Line runs NW to Röslau.
142.0	Line crosses minor road. J (trailing) left, with ST s.o. DE line to Leupoldsdorf (10.2 km.). Line crosses minor road.
144.7
145.1	HOLENBUNN	..	SER. Wb (32 t). N of station and E of line short DE spur, (2) narrow gauge. J (facing) right, with ST s.o. line to Selb Stadt (22 km.). Line crosses minor road.
145.9
146.8	..	Bridge or culvert over stream (Zeitelmsch.).	..
147.1	..	Bridge or culvert over stream.	..
148.1	..	Road overbridge.	Line crosses minor road. Culvert minor road.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
147.0	RÄDLAU		SER. Wb (32 t). Carrying main road to Thiersheim. Line curves right and runs NNE.
147.7	..	Road overbridge.	
150.9	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
152.0	..	Line turns N.	Line crosses 2 minor roads.
153.9	..	..	Line runs NNE to Marktzeuthen. Line crosses minor road.
*155.6	..	Bridge over main road, R. Eger, and minor road.	
*156.1	MARKTZEUTHEN	..	SER. Wb (40 t). Line crosses several small roads and runs NW.
158.5	..	Bridge or culvert over stream.	Line crosses minor road.
160.8	..	..	J (trailing) left, with ST s.o. DE line from Weissenstadt (c. 12 km.). Line crosses minor road.
161.2	KIRCHENLAMITZ OUT	..	SER. Wb (32 t). Line runs NW. Line crosses minor road.
163.6	..	Bridge or culvert over stream (Forellen).	
165.0	..	Ditto	Line crosses 2 minor roads.
166.5	..	Ditto	Line crosses minor road.
167.1	..	Road overbridge.	Line turns N.
167.7	MARTINLAMITZ	..	SER. Wb (40 t). Cr (8 t).
168.2	..	Road overbridge.	Line turns NW.
169.5	..	..
*170.2	..	Bridge over R. Lanitz.	Line turns N and crosses minor road.
*172.9	..	..	J (trailing) left, with DT Nürnberg-Hochstadt-Marktzeuthen line (Route 101). Line closely follows the course of the R. Saale. Line runs NNW. Line crosses roads in town.
173.6	OBERKOTZAU	..	SER. Wb (40 t).
174.8	..	..	Line curves E.
175.8	..	Ditto	Line curves N.
176.5	..	..	Line curves NW.
*176.8	..	Bridge over R. Saale.	
177.1	HOF-MOSCHENDORF	..	Passenger station. Line curves N and then NNE.
177.8	..	..	Line curves N.
178.2	..	..	Line curves NW.
*179.2	HOF HAB.	..	Passenger and goods station. SER. Wb (40 t). Cr (30 t). NY. Loco depot. RpS (Loco and C and W). For details, see Route 101. J (facing) left, with T s.o. line to Bad Steben (27.0 km.) and Schwarzenbach am Wald (28.7 km.).

ROUTE 108

MÜNCHEN (HBF)-MÜHLDORF-SIMBACH

General Description

The line runs in a NE direction from München to Walpertskirchen (42.9 km.), where it turns eastwards to follow the valley of the R. Isen to Mühlendorf J for ST lines SW to Rosenheim (Route 109), SE to Freilassing (on Route 124), and N to Neumarkt St. Veit J for Landshut on the München-Regensburg main line, Landau on the Landshut-Plattling ST line, and Pocking on the branch line Simbach-Passau.

From Mühlendorf, the line follows left bank of the R. Inn to Simbach, where the main line crosses the Inn and the German-Austrian frontier to Ried, Linz and Vienna, whilst the branch to Passau continues N of the river.

Track is mainly single but the line is of some importance in providing main line service to Mühlendorf and Simbach, in addition to an alternative route for Linz and Vienna, to that afforded by the main DT line via Salzburg.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
- LENGTH: 123.5 km. (76½ miles).
3. TRACK:
 - München Hbf-Markt Schwaben (30.9 km.), double.
 - Markt Schwaben-Simbach, single.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.

5. MAXIMUM GRADIENT: 7 per mille (1 in 139).

6. MINIMUM RADIUS OF CURVES: 400 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

8.6 km. (5½ miles).

Thann-Matzbach 48.3 km.-Dorfen 56.9 km.

9. ENGINE SHEDS:

München-Pasing

München Ost.

Simbach.

10. MARSHALLING YARDS:

München-Pasing.

München Ost.

11. WATERING FACILITIES: As in 9 above, no other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Railway workshops at München, also locomotive and marshalling facilities given in 9 and 10 above.

(b) Junctions at München, Mühlendorf and Simbach.

(c) Bridges at München (see Plan 32 and 32c), also at 6.3, 32.7, 35.3, 42.4, 52.7, 82.3 and 86.0 km.

13. CAPACITY:

Trains per day
each way

Net train load tons
military stores

(Throughout capacity) 12-16

400

Distance from München

Km.	Stations	Engineering works	Details and facilities
410.9	FRANKFURT	Routes 82, 85, 86.	
198.6	NÜRNBERG	Route 87.	
130.4	KARLSRUHE	Routes 82 and 75.	
240.3	STUTTGART	Route 82.	
0	MÜNCHEN HBF.	..	<p>Goods Station. SER. Wb (30 t). Cr (25 t). Passenger Station. Loco Depots (Steam and electric). MY (Pasing and Ost). RAS (Loco, Diesel, steam and electric, carriages and wagons) at Pasing, Neauabing, and Freimann. For details of facilities at München, see Routes 122 and 123. Location diagram of area and air photographs. Plans 32-32c, also photograph 11 for ground view of station yard. Connection to small yard, S. of line, comprising 8 DES c. 210 m., 8 LS 140-340 m. Line runs multiple track. J (facing) right, with DT lines to Stuttgart, Treuchtlingen, Landshut, and Buchloe. Line turns SE. J (trailing) right and fly-over with DT 1-loop line from München-Pasing. MY for connection, avoiding München Hbf, to R. 122, 82, 85, 106, and 124 for Augsburg, Treuchtlingen.</p>
		2 road overbridges.	
1.6	..	..
3.2	..	..
1.4	..	..

Km.	Stations	Engineering works	Details and facilities
5.4	MÜNCHEN-SÜD	..	1 island platform c. 400 m. long. 4 through tracks. Ment Yard: 8 A station, 8 LS (240-370 m.); 4 LS (220-380 m.); 4 LS (170-220 m.). Goods Yard: SER. Wb (40 t). Cr (20 t). c. 22 DES (9 x 210-380 m., 13 x c. 270 m.). J (facing) right, with DT electric to Pullach, thence ST s.o. to Bichl.
*6.0	..	..	Line turns ENE.
*6.3	..	Bridge over R. Isar.	J (trailing) right, with DT local line for Deisenhofen.
*6.8	..	..	J for Holzkirchen line.
*9.0	..	..	Line curves NE and runs to München Ost Pbf.
9.8	MÜNCHEN OST Pbf.	..	Passenger station. (For details, see Line 122.)
*10.1	..	..	J (facing) left, with ST line to Johanneskirchen and München-Freimann.
*12.4	MÜNCHEN OST	..	MY: Capacity 2,000 wagons per 24 hours. ES. Tbl. W. SER. Wb (60 t). Cr (20 t). For details, see Route 122.
*13.3	..	..	J (facing) right, with DT electrified line to Rosenheim and Kufstein (Route 123).
..	..	Railway bridge.	Line curves ENE.
..	..	..	Line passes over ST loop from Johanneskirchen and München-Freimann line.
..	..	..	J (trailing) left, with line from München Ost MY.
14.7	..	Road overbridge.	Carrying main road to Haag.
16.0	MÜNCHEN-RIEM	..	SR. Wb (30 t). Line crosses main road after station. Line crosses 3 minor roads.
20.0	FELDKIRCHEN (bei MÜNCHEN)	..	SER. Wb (40 t). Line crosses 2 minor roads.
22.1	HEIDSTETTEN	..	Passenger halt. Line crosses 2 minor roads.
24.1	GRUB	..	Passenger station. Line crosses main road.
26.1	POING	..	SER. Wb (30 t). Line crosses 3 small roads.
28.9	..	..	Line runs NE.
29.3	..	Bridge or culvert over stream.	Line crosses minor road.
30.9	MARKT SCHWABEN	..	Line crosses 2 minor roads.
31.4	..	..	SER. Wb (30 t). J (facing) left, with ST s.o. DE line to Erding Flughafen (14.6 km.). End of DT; beginning of ST. Line crosses secondary road.
*34.7	..	Bridge over R. Sempt.	..
34.2	..	Bridge or culvert over stream.	Line crosses minor roads.
*35.1	..	Bridge over R. Schwallach.	Line crosses several minor roads.

Km.	Stations	Engineering works	Details and facilities
39.0	HÖRLINGEN	..	SER. Wb (25 t). Line crosses 2 minor roads.
41.2	..	Bridge or culvert over stream.	Line crosses minor road.
42.0 *42.4	WALPERTSKIRCHEN	Bridge over R. Strögen.	SR. Wb (30 t). Line crosses 2 minor roads. Line curves E, and runs mainly in that direction to Simbach.
44.2	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
48.3	THANN-MATZBACH	..	Passenger station. Restricted cattle facilities. J (facing) right after station with ST s.o. DE line to Haag (c. 18 km.). Line crosses minor road.
51.2	..	Bridge or culvert over stream.	Line crosses minor road.
*52.7	..	Bridge over R. Isen.	Line crosses minor road. Line recrosses minor road.
54.9	..	Bridge over R. Lappach.	Line crosses secondary road. Line crosses main road from Haag just before reaching station.
56.9	DORFEN BHF	..	SER. Wb (40 t). J (facing) left after station with ST s.o. DE line to Velden.
61.0	WASENTGERNBACH	..	Restricted goods facilities. (Packages up to 250 kg.)
63.8	SCHWENDEGG	..	SER. Wb (30 t). Line crosses 2 small roads.
64.7	..	Bridge or culvert over stream.	
65.1	..	Ditto	Line crosses 3 small roads.
69.3	..	Ditto	
71.3 71.7 72.4	WEIDENBACH	Road overbridge. Bridge or culvert over stream.	SR. Wb (30 t). Carrying small road.
72.8	..	..	Line crosses secondary road. Line curves ENE.
73.6	..	..	Line crosses minor road. Line runs E to station. Line crosses main road before station.
76.3	AMPFING	..	SER. Wb (30 t). Line crosses 3 small roads.
81.2	..	..	Line crosses main road to Mühl- dorf.
*82.3	..	Bridge over Innwk. canal.	Line crosses minor road.
84.6	MÜHLDORF (OBERBAY.)	..	SER. Wb (40 t). Line crosses minor road.
85.0	..	..	J (facing) left, with ST s.o. line to Pilsing (c. 40.4 km.) on Route 104, Landsbut (34.5 km.) on Route 106, and Pocking (38.7 km.) on ST line Simbach-Passau. Line follows the valley of R. Inn.

Km.	Stations	Engineering works	Details and facilities
85.5	..	..	J (facing) right after Muhldeef station with ST s.o. line to Freilassing (s. 65.5 km.), which is on the LT electrified Wörgl-Kitzbühel-Salzburg-Rosenheim line (Route 124).
86.0	..	Bridge over Innwk. canal.	Line crosses 2 minor roads.
90.4	TÖGING (INN)	..	SER. Wb (40 t). Line crosses minor road. J (facing) right, with DE spur running towards canal. Line crosses minor road. Line crosses main road. Line crosses minor road.
95.5	..	..	..
96.5	..	Bridge or culvert over stream.	Line crosses minor road.
97.5	NEUÖTTING	..	SER. Wb (40 t).
97.9	..	..	Line crosses main road.
99.6	..	Ditto	..
101.2	..	Ditto	Line crosses secondary road.
103.2	PERACH	..	Restricted goods facilities. (Packages up to 250 kg.)
104.0	..	Bridge or culvert over stream.	..
105.3	..	..	Line runs NE and then SE, following closely the course of the R. Inn. Line crosses minor road and runs E into station.
110.6	MARKTL	..	SER. Wb (30 t). Line crosses 3 minor roads. Line crosses main road.
113.4	..	..	..
113.8	..	(?) Bridge over river.	Line crosses minor road.
115.4	BUCH (INN)	..	SER. Wb (30 t). Line crosses 2 minor roads.
118.6	JULBACH	..	Restricted goods facilities. (Packages up to 250 kg.) Line crosses 2 minor roads.
121.1	..	Bridge or culvert over stream.	Line crosses minor road, curves left and runs NE to Simbach station.
121.9	..	..	Line crosses main road.
123.6	SIMBACH (INN)	..	SER. Wb (40 t). Cr (8 t). ES. Line continues ST to Ried in Austria, thence to Linz and Vienna. A branch line also runs N to Pocking (distance 28.4 km., axle load 12 t), thence to Passau (62.5 km.), terminus of Route 104.

ROUTE 108A

MÜHLDORF-NEUMARKT-ST. VEIT-LANDSHUT

General Description

Linking Mühlhof with Landshut, this line together with Route 109 provides a route for traffic from the area S of Rosenheim to N Bavaria, Leipzig and Berlin alternative to the main DT route via München.

After the junction with Route 108 at 0.5 km., the line proceeds northwards, crossing the Inn valley to proceed along the valley of a tributary to its source and thence to Neumarkt, J for ST lines to Landau on the Plattling line, and Pocking on the Simbach-Passau line.

From Neumarkt the line turns NW to continue through rather hilly country along the valley of the Tegern Bach to 22.5 km. and thence proceeds through a hilly range crossing several minor valleys and finally the R. Isar shortly before joining the main electrified line München-Regensburg (Route 108) at Landshut.

Gradients will most probably be severe throughout the route.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 54.5 km. (33½ miles).
3. TRACK: Single.

4. MAXIMUM PERMISSIBLE AXLE LOAD:

Mühlhof (Oberbay.)-Neumarkt-St. Veit,
18 metric tons.
Neumarkt-St. Veit-Landshut, 20 metric tons.

5. MAXIMUM GRADIENT: 13 per mille (1 in 74).

6. MINIMUM RADIUS OF CURVES: 300 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

8.9 km. (5½ miles).

9. ENGINE SHEDS: Landshut.

10. MARSHALLING FACILITIES: No information.

11. WATERING FACILITIES:

Landshut. (No other details.)

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Locomotive facilities at Landshut.

(b) Junctions at Mühlhof, Neumarkt-St. Veit and Landshut.

(c) Bridges at 1.5, 4.5, 22.5, 31.3, 41.2 and 51.9 km.

13. CAPACITY:

Trains per day each way	Net train load tons military stores
12	300

Distance from Mühlhof

Km.	Stations	Engineering works	Details and facilities
61.7	ROSENHEIM	Route 109.	
84.6	MÜNCHEN	Route 108.	
0	MÜHLDORF (OBERBAY.)	..	SER. Wb (40 t).
*0.4	..	..	J (facing) right, with ST s.o. line to Freilassing (Route 108b).
*1.0	..	..	J (facing) right, with s.o. München-Simbach line which is ST from Simbach to Markt Schwaben and DT from Markt Schwaben to München (Route 108).
*1.5	..	Bridge over canal.	Line crosses 2 minor roads.
*4.5	..	Bridge over R. Isar.	Line crosses minor road. Line climbs for some distance and then descends into the valley of the R. Vils.
6.7	ROHRBACH (OBERBAY.)	..	Restricted goods facilities. J (trailing) right with short DES. Line crosses minor road.
9.4	..	Short tunnel.	Line crosses 2 minor roads.
14.6	..	Bridge over river.	Line crosses minor road.
15.6	NEUMARKT-ST. VEIT	..	SER. Wb (40 t).
*16.2	..	..	Line crosses minor road. J (facing) right, with ST s.o. lines to Plattling and Pocking. Line curves sharply left and runs NW. Line crosses road from Neumarkt-St. Veit to Völsding.
22.0	..	..	SER. Wb (40 t).

Km.	Stations	Engineering works	Details and facilities
*22.5	..	Bridge over Tegern Bach.	Line continues minor road. Line crosses road just before station.
25.6	AICH (NIEDERBAY.)	..	SER. Wb (30 t). Line crosses minor road.
31.0	..	..	..
*31.3	..	Bridge over R. Vils.	Line crosses minor road.
38.1	VILSHUBURG	..	SER. Wb (30 t). Line crosses minor road after station and then curves left. Line climbs and later descends into the valley of the R. War. Line crosses road.
36.4	HÖHENBERG	..	Passenger station. Line crosses minor road.
..	..	Bridge over R. Kleine Vils.	Shortly before reaching Geisenhausen station.
41.2	GEISENHAUSEN	..	Line crosses minor road just before station.
45.4	GÖTZDORF	..	Restricted goods facilities. Line crosses minor road.
..	..	Bridge over road and stream.	..
51.3	LANDSHUT (BAY.) SÜD	..	SER. ES. Tbl. W. Line crosses road.
*51.9	..	Bridge over R. Isar. Bridge or culvert over stream.	..
..	..	Ditto 2 bridges or culverts over streams.	Bridge over minor road. Line crosses minor road.
..	..	..	J (trailing) left at Landshut Hbf. with DT electrified line from München to Regensburg (Route 106).
54.5	LANDSHUT (BAY.) Hbf.	..	SER. Wb (40 t). Cr (10 t). For details of station, see Route 106. Line continues DT electric to Regensburg as Route 106.

MÜHLDORF TO FREILASSING

ROUTE 108

MÜHLDORF-FREILASSING

General Description

Together with Route 108, with which it is connected at Mühlhof, this line, although ST provides an alternative route between München and Salzburg to that provided by Routes 123 and 124.

From Mühlhof the line proceeds S, crossing the hilly country dividing the valleys of the R. Inn and R. Alz, to Garching (16.4 km.) J for a local branch line to Traunstein on Route 124.

From Garching the line turns SE, passing through hilly country to Laufen on the German-Austrian frontier, whence it proceeds S along the valley of the R. Salzach to join the main line from München.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 65.5 km. (40½ miles).
3. TRACK: Single.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 11 per mille (1 in 90).
6. MINIMUM RADIUS OF CURVES: 450 m.

7. TRACKING: Single.

8. MAXIMUM DISTANCE BETWEEN STATIONS: 7.4 km. (4½ miles).

9. ENGINE WORK: Freilassing.

10. MARSHALLING FACILITIES: Freilassing.

11. WATERING FACILITIES: Freilassing.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Marshalling and locomotive facilities at Freilassing.

(b) Junctions at Mühlhof, Garching and Freilassing.

(c) Bridges at 3.3, 16.9, 17.6, 61.8 km., the most important being that over the R. Inn at 3.3 km. and that over the Alz at 17.6 km.

13. CAPACITY:

Trains per day each way	Net train load tons military stores
12	300

Distance from Mühlhof

Km.	Stations	Engineering works	Details and facilities
84.6	MÜNCHEN	Route 108.	
0	MÜHLDOF (OBERBAY)	...	SER. Wb (40 t). Line crosses minor road.
*0.4	..	..	J (facing) left, with s.o. München-Simbach line, which is ST from Simbach to Markt Schwaben, and DT from Markt Schwaben to München (Route 108), also with ST s.o. line to Landshut (Route 108.1).
			Line crosses minor road.
*3.3	..	Bridge over R. Inn.	Line crosses minor road.
3.7	MÜHLDOF-EHRING	..	Passenger halt. Line crosses 2 minor roads.
7.1	TÜSLING	..	SER. Wb (30 t). J (facing) left, with ST s.o. dead end line to Burghausen (23.1 km.). Line crosses minor road.
8.3	..	Bridge or culvert over stream.	
10.9	MAUERBERG	..	SER. Wb (30 t). Line crosses 3 minor roads.
13.8	..	..	J (trailing) left, with short dead end line which crosses canal and runs towards R. Alz.
16.4	GARCHING	..	SER. Wb (40 t). Carrying minor road.
*16.9	..	Road overbridge. Bridge over canal.	
*17.0	..	..	J (facing) right with ST s.o. line to Traunstein (33.9 km.), which is on the main DT electrified München-Salzburg line (Route 109). Line crosses minor road. Line crosses main road from Garching-Traunstein.
*17.6	..	Bridge over R. Alz.	Line crosses numerous small roads.

Km.	Stations	Engineering works	Details and facilities
24.2	KIRCHWEIDACH	..	SER (only 7 m. long). Wb (30 t). Line crosses several minor roads.
28.4	TYRLACHING	..	SER. Wb (30 t). Line crosses several minor roads. Line now runs in the valley of the R. Salzach.
31.7	LANZING	..	Passenger station. Line crosses 2 minor roads.
35.3	..	..	J (trailing) left, with ST s.o. dead end line from Tittmönning (5.9 km.). (Axle load 12.5 t). Line crosses minor road.
35.8	WIESMÜHL (B. TITTMÖNING)	..	SER. Wb (30 t). Line crosses minor road.
36.1	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
37.5	..	Ditto	Line crosses numerous minor roads.
41.1 41.4	..	2 bridges or culverts over streams.	SER. Wb (30 t).
41.9	FRIDOLFING	Bridge or culvert over stream.	Line crosses 2 minor roads.
43.4 44.3 45.4	..	3 bridges or culverts over streams.	Line crosses 3 minor roads.
46.1	KIRCHANSCHÖRING	..	SER. Wb (30 t).
46.8	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
48.5	..	Ditto	Line crosses 3 minor roads.
50.0	..	Ditto	Line crosses minor road.
50.7	..	Ditto	Line crosses 2 minor roads.
53.5	LAUFEN	..	SER. Wb (40 t). Line crosses minor road.
57.0	GAETAO	..	Passenger station. Line crosses 2 minor roads.
60.4	SURHOFEN	..	SER. Wb (30 t). Line crosses 2 minor roads.
61.8	..	Bridge over R. Sur.	Line crosses 2 minor roads. Line crosses main road Waging- Salzburg.
64.5	..	..	J (trailing) right, with DT elec- trified line München-Salzburg (Route 124). Also J (trailing) right, with ST electrified line from Bad Reichen- hall.
65.5	FEHLASING	..	SER. Wb (30 t). ES. Tbl. W. MY. 2. to roads. Line continues to Salzburg as Route 124.

ROSENHEIM TO MÜHLDORF

115

ROUTE 123

ROSENHEIM-MÜHLDORF

General Description

Connecting at Rosenheim with Route 123 from Innsbruck, in addition to Route 124 from Salzburg, this line, which is ST throughout, together with Routes 108a and 108, provides means for through services for traffic from places S. of Rosenheim, to N Bavaria, as an alternative to the main line via München.

The line follows the course of the R. Inn, which it crosses at 36.5 and 47.8 km., and gradients therefore are not considerable, the only point where gradients are likely to be restrictive being between Wasserburg and Gars.

At Wasserburg the line is joined by a local branch line from Grafing on the main München-Rosenheim line, but the capacity of this line would be very light and the line is only of local importance.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 61.7 km. (38½ miles).
3. TRACK: Single.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 17 metric tons.

5. MAXIMUM GRADIENT: 5.6 per mille (1 in 178).

6. MINIMUM RADIUS OF CURVES: 300 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

9.5 km. (6 miles).

Kraiburg 52.2 km.-Mühldorf 61.7 km.

9. ENGINE SHEDS: Rosenheim.

10. MARSHALLING FACILITIES:

Rosenheim (Kolbertmoor).

11. WATERING FACILITIES:

Rosenheim. (No other details.)

12. VULNERABLE POINTS:

(a) Marshalling and locomotive facilities at Rosenheim.

(b) Junctions at Rosenheim, Wasserburg and Mühldorf.

(c) Bridges at 12.6, 36.5 (over R. Inn), 47.8 (over R. Inn) and over 59.6 km.

13. CAPACITY:

Trains per day

each way

12-16

Net train load tons

military stores

400

Distances from Rosenheim

Km.	Stations	Engineering works	Details and facilities
144.1	BRENNER	Routes 123 and 123A.	
107.1	INNERBRUCK	Ditto	
*0	ROSENHEIM	..	Electric sub-station. SER. Wb (40 t). Cr (7.5 t). 2 ES (RH). Tbl. W. MY at Kolbertmoor. Line runs N and NNE, following the valley of the R. Inn. Carrying minor road. J (facing) left, with ST s.o. line to Holzkirchen.
0.9	..	Road overbridge.	
*1.1	..	..
	..	Bridge or culvert over stream.	
*1.5	..	..	J (facing) left with DT electric line Kufstein-München (Route 123). Line crosses minor road. Ditto
	..	Ditto	Line crosses 2 minor roads.
6.2	..	Ditto	Ditto
8.4	..	..	Line crosses main road.
9.3	SCHNECHEN	..	SER. Wb (30 t). Line crosses 2 minor roads.
*12.6	..	Bridge over R. Rott.	Line crosses minor road.
14.4	..	Bridge or culvert over stream.	Ditto
14.9	..	..	Line crosses main road. Line crosses minor road.
16.2	ROTT (INN)	..	SER. Wb (30 t). Line crosses secondary and minor road.
18.1	..	Bridge or culvert over stream.	
18.4	..	Ditto	
19.2	..	Ditto	
23.0	RAMSBERG	..	Roundabout goods line. (R. Inn) s.o. line to München.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
21.4	..	Bridge or culvert over stream.	Carrying minor road.
21.5	..	Road overbridge.	
22.5	..	Bridge or culvert over stream.	
*25.1	..	..	Line crosses 2 minor roads. J (trailing) left, with ST s.o. line to Grafing (c. 24 km.) on the DT electric Kufstein-München line (Route 103).
25.2	..	..	J (trailing) right, with short DE line from Wasserburg Stadt station (3.9 km.).
25.3	..	..	Line crosses main road.
25.7	WASSERBURG (INN) BHP.	..	SER. Wb (40 t). Line crosses minor road at station.
29.5	..	Road overbridge.	Line crosses 2 minor roads.
			Carrying main road.
			Line crosses minor road.
			Line runs along E side of the Soyen See for c. 1 km.
31.7	SOYEN	..	Line crosses minor road.
			Soyen See for c. 1 km.
*36.5	..	Bridge over R. Inn.	SER. Wb (30 t). Line crosses 4 minor roads. 261 m. long, 48 m. high. Line follows right bank of R. Inn. Line crosses minor road.
40.4	GARS (INN)	..	SER. Wb (30 t). Line runs E.
42.4	..	..	Line crosses 2 minor roads.
			Line turns NE and continues in that direction until c. 2.5 km. from Mühlendorf, when it runs E to Mühlendorf.
43.1	MITTERGARS	..	Line crosses 2 minor roads.
			Passenger station. Restricted cattle facilities. Line crosses minor road.
46.5	JETTENBACH	..	SER. Wb (30 t).
*47.8	..	Bridge over R. Inn.	Line crosses numerous roads.
52.2	KRAIBURG	..	SER. Wb (30 t).
57.1	..	..	Line crosses main road.
58.3	..	Road overbridge.	J (trailing) left, with s.o. line from München to Simbach (Route 108).
59.5	..	..	This line is DT from München to Markt-Schwaben and ST from Markt-Schwaben to Mühlendorf.
*59.6	..	Bridge over canal.	
61.7	MÜHLDORF	..	SER. Wb (40 t). J for ST main line München-Simbach (Route 108), ST line to Landshut (Route 108.1), with connections at Neumarkt to Landau on Landshut-Plattling line, and to Pocking on branch line Simbach-Passau, also ST line to Freilassing (Route 108B).
116.2	LANDSHUT	R. 108.1.	
120.2	SIMBACH	R. 108.	

ROUTE 110

BASEL DRB PHF-LORRACH-SCHOPFHEIM-SACKINGEN

General Description

This ST line, which provides an electrified local service to the area around Basel on the German side of the R. Rhine, affords also a service to Sackingen alternative to that provided by Route 113.

The line follows the valley of the R. Wiese to Schopfheim, where it turns E via a long tunnel c. 3 km. long under the Kurnberg to enter the narrow valley of a further tributary and proceed S to join the main line at Sackingen.

A J at Lorrach connects with a loop line from Weil MY, and at Schopfheim an electrified branch line to the N connects with Zell, where interchange facilities exist with a narrow gauge line running further N into the mountains to Todtnau.

Sources for supply of power are at Rheinfelden and Ryburg-Schworstadt.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 41.2 km. (25½ miles).
3. TRACK:
Basel DRB 1.7 km., double.
Sackingen 1.7 km., single.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 16 metric tons.

5. MAXIMUM GRADIENT: 10 per mille (1 in 98).

6. MINIMUM RADIUS OF CURVES: 270 m.

7. TRACTION: Electric.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

6.3 km. (4 miles).

Schopfheim 21.5 km. Huel 27.8 km.

9. ENGINE SH DS: Basel-Hädischer.

10. MARSHALLING FACILITIES:

Basel (Weil), Basel (Muttens) (Switzerland).

11. WATERING FACILITIES:

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Locomotive and marshalling facilities at Basel.

(b) Electric power stations at Rheinfelden and Ryburg-Schworstadt (see Route 113).

(c) Junctions at Basel and Sackingen.

(d) Bridges at 13.0 and 16.2 km.

(e) Tunnel at 24.6 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
With electric traction	24	400
Steam	12-16	350

Distance from Basel

Km.	Stations	Engineering works	Details and facilities
267.8	MANNHEIM	..	Routes 111, 75 and 67.
195.2	KARLSRUHE	..	Routes 111, 75.
132.2	APPENWEIER	..	Route 111.
0.	BASEL	..	German State Railway Main Station. Passenger Station with facilities for dealing with parcels traffic. Goods Station: SER. Wb (40 t). Cr (20 t). Marshalling Yard: Capacity 2,400 wagons per 24 hours. Loco. Depot: ES. Tbl. W. RpS. J for Route 111 to Appenweier, Karlsruhe, Mannheim, also for connecting lines to Lucerne via Swiss Federal Railways. For details of facilities see Route 111. For location diagram see Plan 46, and for illustrations of approaches to Basel station, Photographs 9 and 9a. Line runs common with Route 113.
0.7	..	Bridge over minor road.	
1.0	..	Ditto	
1.3	..	Ditto	
1.5	..	..	J (facing) right, with ST line to Singen (Route 113).
2.3	..	Ditto	
4.9	..	Ditto	
4.6	RIESEN (BYI BASEL)	..	SR. Wb (25 t). Cr (10 t). Line crosses several minor roads after station. Line crosses Swiss-German frontier. J (trailing) left at Lorrach-Stetten station with ST s.o. line from Basel DRB Ph and MY avoiding Rachen. Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
6.6	LORRACH-STETTEN	..	Passenger station. Line crosses minor road at station.
8.1	LORRACH	..	SER. Wb (60 t). Cr (20 t). Line crosses numerous roads in Lorrach.
9.2	..	Road overbridge.	Carrying minor road.
10.7	HAAGEN (BADEN)	..	SER. Wb (25 t). Cr (6 t). Line crosses minor road at station.
11.8	BROMBACH (BET LORRACH)	..	Restricted goods facilities. Line crosses minor road.
*13.0	..	Bridge over R. Wiese.	Line crosses main road from Lorrach to Schopfheim.
14.2 14.3	..	2 bridges over streams.	Line runs E to Schopfheim.
15.3	STEINEN	..	SER (only 7 m. long). Wb (35 t). J (trailing) left, with DE spur from factory. Line crosses numerous roads between Steinen and Schopfheim.
*16.2	..	Bridge over R. Wiese.	
18.5	MAULBURG	..	SER. Wb (25 t). Cr (6 t).
19.4	..	Bridge over stream.	J (trailing) left, with DE spur from factory.
21.5	SCHOPFHEIM	..	SER. Wb (35 t). Cr (4 t). Line crosses several roads.
23.2	..	..	J (facing) left, with ST electric line to Zell (Wiesental) (c. 6.3 km.). From Zell there is a DE narrow-gauge (1 m.) line to Todtnau (c. 16 km.).
23.6 24.5	..	Bridge or culvert over stream (Schlier).	Line crosses road.
*24.6	..	Tunnel. 2 road overbridges.	Line curves sharply right and runs SE to Hasel passing through a long tunnel. c. 3 km. long.
27.8	HASEL	..	SR. Line runs in a mainly southerly direction almost to Säckingen. Line crosses 2 roads.
30.7	WEHR (BADEN)	..	SER. Wb (40 t). Cr (6 t). Line crosses several roads.
33.4	OEPLINGEN	..	SR. Wb (25 t).
34.7	..	Road overbridge.	Carrying minor road.
35.4	BRENNET (WEHRTAL)	..	Passenger station. Line runs in valley of R. Rhein to Säckingen.
38.1	..	..	Line crosses road after station. J (trailing) right, with Basel-Singen line (Route 113). Line crosses road. Line curves left and runs ESE and then NE into Säckingen station. Line crosses numerous roads in Säckingen.
41.2	SACKINGEN	..	SER. Wb (35 t). Cr (4 t). Line proceeds E. to Singen and Konstanz (Route 113).

ROUTE 111

BASEL-FREIBURG-OFFENBURG-APPENWEIER

General Description

Together with Route 75 and 67, this line provides the only direct main line service from the Swiss frontier to Karlsruhe, Mannheim and Frankfurt.

Forming one of the oldest German trunk lines, it was originally built to the Irish gauge (1-67 m.) but was converted to standard gauge in 1855.

Running N from Basel between the Schwarzwald (wooded hilly district) and the Rhine, the line at first closely skirts the hillside, with 3 tunnels between Ebingen and Kleinheims.

After Schliengen (26.5 km.) the line descends into the Rhine valley and for the rest of the journey runs in fairly straight stretches over more level country, crossing many streams and a few rivers, and carried over marshy ground by embankments.

The exit from Basel is particularly vulnerable from the point of view of bridges, the R. Wiese entailing no less than 10 bridges of c. 70-90 m. for the main line and connections serving the MY, goods yard and dock installations.

At Freiburg a deviation is made to serve the town, while goods traffic and through trains run over an avoiding line running direct from Leutensberg to Gündelfingen.

The principal junctions, in addition to Basel where connections exist with the Swiss Federal Railways over the Rhine and with Route 113 to Singen and Konstanz, are at Mülheim with Route 111d from Mülhausen, at Freiburg with Route 111a from Colmar, and Route 111b to Donaueschingen and at Appenweier with the main line Strasbourg-Karlsruhe (Route 75).

General Details

1. GAUGE: 1435 mm. (4 ft. 8 1/2 in.). Standard.
2. LENGTH: 132.2 km. (82 1/2 miles).

3. TRACK: Double.

4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.

5. MAXIMUM GRADIENT: 6 per mille (1 in 165).

6. MINIMUM RADIUS OF CURVES: 304 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

Freiburg (Breisgau) Hbf-Gündelfingen, 5.6 km.

9. ENGINE SIZES:

Basel DRB. Haltingen.
Freiburg Hbf. Offenburg.
Freiburg Gbf.

10. MARSHALLING FACILITIES:

Basel. Freiburg. Offenburg.

11. WATERING FACILITIES: As in 9 above. No other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Locomotive and marshalling facilities given in 9 and 10 above.

(b) Repair shops at Basel.

(c) Junctions at Basel, Mülheim, Freiburg and Offenburg.

(d) Bridges at Basel (0.9, 1.0, 4.8 km.) and at 48.3, 61.3, 61.6, 71.7, 88.2, 88.6 and 121.3 km.

(e) Tunnels at 10.7, 13.7 and 14.2 km.

13. CAPACITY:

Trains per day	Net train load tons
each way	military stores
72	500

Distance from Basel

Am.	Stations	Engineering works	Details and facilities
0	BASEL (DRB)		<p>Main Station, German State Rly. SER. Wb (40 t). Cr (20 t). ES. Thl. W. MY. Rps.</p> <p>Passenger Station: 2 main platforms (island), c. 600 m. long with 3 shorter platforms (covered) to the E, 2 x 200 m., 1 x 250 m. long. Main station entrance on W-12 through tracks. DT goods line from Muttens and Lottach direction to MY E of coaling plant—five ground photographs of N and S approaches to station, see photographs 9 and 10.</p> <p>Carriage Siding: N of station, E of running lines, c. 9 LS 360-400 m. W of running lines a further group of 6 short LS with grid of spurs from one siding serving sheds, herring-bone design, probably used for parcels traffic—size of shed 120 x 30 m., with 4 storage bays.</p> <p>Goods Station: N of passenger station, E of line, LS siding 200 m. long with through siding—length of shed 120 m., width 30 m., N and S ends.</p>

K.	Stations	Engineering works	Details and facilities
			<p>Mechanical coaling plant, S of shed (E. of passenger station)—traveller type, see Photograph 9.</p> <p>Goods Station: Served by connection from MY by a bridge over R. Wiese, c. 67 m. long—probably lattice girder through.</p> <p>SEB. Wb (40 t). Cr (20 t). Modern, well equipped, and well designed yard.</p> <p>2 goods sheds herring-bone design, one c. 320 x c. 33 m. with 8 bays, the other c. 280 x 33 m. with 7 bays, 3 DES c. 450 m. long situated between the sheds, with a additional DES each with grid of short spurs serving bays. W of sheds a DES c. 450 m. long, one with road access, the other with side loading facilities from shed. a DES c. 450 m. long serving similar purpose on E side of sheds.</p> <p>East of Sheds: 3 DES c. 340 m. (a with road access), 1 DES c. 980 m., with short spurs each side with road access, and short siding serving ramp, also 1 DES c. 250 m. with road access, also serving ramp.</p> <p>Further E, 1 DES c. 450 m. with 8 spur sidings serving 3 outside storage dumps, and 3 DES c. 450 m., each alongside group of warehouses.</p> <p>Extreme West of Yard: 3 DES c. 320 m. running alongside group of warehouses, with trailing connection at N end to industrial plant.</p> <p>Marshalling Yard (Weil): Capacity 2,400 wagons per 24 hours.</p> <p>Reception and Departure Sidings: S end of yard.</p> <p>Departure, 8 LS c. 800 m. long.</p> <p>Reception c. 6 LS, c. 800 m. long.</p> <p>2 similar groups of sidings extend N of Weil station.</p> <p>Marshalling Sidings: 2 groups of c. 13 LS each, c. 700-750 m.</p> <p>Sorting Sidings: Between 3 reception and departure sidings, comprising c. 26 LS each c. 135 m. In addition, 3 groups of LS W of yard—</p> <ol style="list-style-type: none"> (1) 16 c. LS c. 700 m., with connection to goods yard, industrial establishments W of line and also to port area. (2) c. 8 LS c. 340 m. long, probably subsidiary sorting sidings. (3) c. 13 LS c. 340 m. long, connected at N end to Rps. <p>Docks Sidings: Adjacent to river and served by connection from MY.</p> <p>8 LS c. 600 m. long, served by 2 parallel ST deck girder through bridges over R. Wiese, all converging at S end to short spur serving 2 DES running for c. 120 m. along riverside wharves. Connection also from S end of LS to 11 LS c. 100-300 m. and 3 DES c. 250 m.</p>

Km.	Stations	Engineering works	Details and facilities
			<p>Connections from these 2 latter groups of sidings to track basins via 3 bridges, single track deck girder through spans c. 55 m. long over R. Wiese.</p> <p>A small MY exists at Bâle (Basel) St. Louis (see I.S.T.D. C. 1300), and also a large MY at Moutiers (Swiss Federal Railways).</p> <p>Railway Workshops: N end of MY, served by large group of sidings—no details available.</p> <p>For location diagram of facilities Basel, see Plan 40.</p>
0.7	..	Bridge over R. Wiese.	J (facing) with connection left to MY via bridge over R. Wiese, c. 70 m. long—probably lattice girder through span.
0.10	..	Fly-over.	c. 70 m. long—deck girder through span.
			Line crosses road and avoiding line from Sigen and Swiss frontier direction; also from Schopfheim (Route 110)—a parallel lattice girder (shw) bridge 1 x c. 70 m., 1 x c. 55 m.
			The avoiding line itself crosses the R. Wiese by a bridge c. 47 m. long, DT lattice girder through span.
2.3	..		J (trailing) right, with DT a.o. line from MY.
2.8	..	Road overbridge.	J (trailing) right, with ST line from Schopfheim (Route 110).
2.9	..		
3.0	WEIL (RHEIN)		SER. Wb (35 t). Cr (10 t). c. 2 island platforms. 1 single-headed platform.
3.6	..		J (trailing) with connection from MY.
3.7	..		J (facing) left, with connection to Rps.
4.3	..		Embankment. Line curves from NE to NW.
4.8	..	Fly-over.	Line passes over ST a.o. line from MY to riverside.
5.0	..		Line crosses road.
5.4	HALTINGEN		SER. Wb (25 t). Cr (2 t).
			J (facing) right, with ST local line to Kandern (12.9 km.).
			J (trailing) left, with ST a.o. avoiding line from MY.
			Line begins straight stretch c. 5.5 km. long.
6.2	..	Road overbridge.	
7.5	EIMKINDINGEN		SER. Wb (25 t). Cr (4 t).
8.0	..		Embankment, c. 0.7 km. long. Line crosses marsh.
9.9	..		Line crosses road.
10.4	..		Embankment, c. 0.9 km. long. Line crosses road and gradually curves W.
11.4	EPRINGEN-KIRCHEN		SER. Wb (25 t). Cr (6 t).
11.5	..		Line crosses road.
11.7	..		Ditto
12.7	..	Tunnel.	c. 300 m. long. Tunnel curves N, under hillside spur.
13.2	..		Embankment, c. 0.5 km. long.
13.3	ISLIN		Passenger station.
			Line gradually curves W.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
13.7	..	Tunnel.	c. 100 m. long.
13.8	..	..	Embankment, c. 0.4 km. long.
14.2	..	Tunnel.	c. 200 m. long. Tunnel curves NW under hillside spur.
14.4	..	..	Line gradually curves N, and runs between hillside and woodland to Kleinkem.
16.9	KLEINKEM	..	Restricted goods facilities.
19.7	RHEINWEILER	..	Line curves E and then NE.
20.3	..	..	Line crosses road.
21.9	..	..	Ditto
22.8	..	..	Line curves N.
22.9	BELLINGEN	..	SER, only 7 m. long. Wb (25 t). Cr (4 t).
25.8	..	..	Line leaves hills, and begins straight stretch of c. 16.7 km. through more level country.
26.5	SCHLEINGEN	..	SER. Wb (25 t). Cr (6 t).
27.4	..	..	Line crosses road.
		..	Embankment c. 0.7 km. long across marsh.
29.8	AUGEN	..	SER. Wb (25 t). Cr (6 t).
31.8	..	..	J (trailing) left, with ST s.o. line from Mülhausen (Route 111d).
32.4	MÜLHEIM (BADEN)	..	SER. Wb (35 t). Cr (6 t).
		..	I with metre-gauge ST electrified line to Badenweiler (7.6 km. long).
32.6	..	Bridge over road and stream (Klemm).	Line crosses road.
33.6	..	..	..
35.1	HÜGELHEIM	..	Passenger station.
		..	Line crosses road.
37.0	..	..	Ditto
37.8	BÜGGINGEN	..	SER. Wb (25 t). Cr (4 t).
38.0	..	Bridge over road and stream (Mühlen).	..
38.8	..	..	Embankment, c. 2.2 km. long, across low-lying meadowland.
40.8	..	Bridge over road and stream (Sulz).	..
40.9	HARTENWES	..	SER. Wb (26 t). Cr (2 t).
42.0	..	..	Line turns further NE, and begins straight stretch c. 10 km. long.
42.1	..	Bridge over road and stream (Bruch).	..
43.6	TUNNEL	..	Passenger station.
43.9	..	Bridge or culvert over stream.	..
45.1	..	Road overbridge.	..
46.5	..	Bridge over R. Neumagen.	..
46.8	BAD KROFINGEN	..	SER. Wb (40 t). Cr (10 t).
		..	J (facing) right, with ST s.o. lines to—
		..	1. Sulzbach, 11 km. long
		..	2. Untermaier, 11 km. long.
48.2	..	Bridge over stream (Mühl)	..
50.1	NEUMAGEN	..	Passenger station.
52.0	..	Road overbridge.	..
54.1	..	..	..

Km.	Stations	Engineering works	Details and facilities
52.7 53.1	SCHALLSTADT ..	..	SER. Wb (26 t). Cr (4 t). Line curves N.
53.9 54.2	ERBINGEN ..	Road overbridge.	Passenger halt.
55.0 55.1	LEUTERSBERG ..	..	Passenger only. J—line diverges into 2 DT lines, the westerly track running direct to main goods station and loco- motive depot, avoiding Freiburg station, whilst the other line turns E for c. 3.5 km., before turning N and rejoining the avoiding line at Gündelfingen.
<i>Eastern Branch</i>			
58.3	Freiburg-St. GEORGEN	..	Line runs on embankment for 2.5 km.
58.9 59.5 60.1	..	Bridge over road. Ditto Ditto	Line curves N.
60.9 61.5	..	Fly-over.	Line passes under ST electric line from Donaueschingen (Route 111b).
61.6	..	Bridge over Dreisam Kanal.	
62.5	Freiburg (BAHNGAU)	..	SER. Wb (30 t). ES (Rectangular). Tbl. W. SY. For location diagram of area, see Plan 47.
63.0	..	..	J (facin.) left, with DT line to Colmar (Route 111b).
63.9 64.3	Freiburg-HERDERN ..	Bridge over road.	Halt.
65.4 66.1 66.8	Freiburg-ZÄHRINGEN ..	Road overbridge. .. Road overbridge.	Halt. J (trailing) left, with DT s.o. avoiding line from Leutersberg.
67.0	GÜNDELFINGEN	..	Passenger station.
<i>Western Branch</i>			
55.0 55.1	LEUTERSBERG ..	..	J—line diverges into 2 DT lines, the westerly track running direct to main goods station and loco- motive depot, avoiding Freiburg Station, whilst the other line turns E for c. 3.5 km. before turning N and rejoining the avoiding line at Gündelfingen.
55.8 56.2 56.5 56.8	..	Bridge over road. Ditto Ditto Ditto	
58.0	Freiburg St. G.	..	Goods only. SER. Wb (30 t). Cr (4 t). Following level crossing
58.2 58.3 58.4 58.5 58.6 58.7 58.8	..	Bridge over road. Bridge over Dreisam Kanal Road over bridge Road over bridge Road over bridge Road over bridge Road over bridge	

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
61.4	..	Railway overbridge.	Line passes under 177 line Freiburg-Colmar (Route 111a).
61.6	..	..	J (trailing) left, with Route 111a.
62.2	Freiburg (Breisgau)	..	Main goods station. SER. Wb (40 t). Cr (30 t). ES (Rectangular) 7 through roads. Tbd. W. 4 through tracks. See Photograph 35 and Plan 47a. MY adjoining running lines, comprising 2 groups of sidings. (a) 5 LS. (b) 9 LS. (c) 12 LS. See Plan 47a and Plan 47 for location diagram.
63.8	..	Bridge over road.	Skew bridge over main road from Freiburg to the N.
65.2	..	..	J (trailing) right, DT line from Basel via Freiburg passenger station.
66.1	GÜNDELFINGEN	..	Passenger station.
67.9	..	..	Line crosses main road.
68.1	..	Bridge or culvert over stream (Tauben).	..
69.8	..	..	Line crosses road.
69.9	DENZLINGEN	..	SER. Wb (25 t).
70.6	..	..	J (facing) right, with ST s.o. DE line to Elzach (distance 19.2 km.).
70.9	..	..	Line crosses main road.
71.7	..	Bridge over R. Elz.	Line begins wide curve NE.
72.6	..	..	..
73.2	KOLLMARSREUTE	..	Passenger station.
73.8	..	..	Line crosses main road.
74.3	..	..	Line crosses road.
74.6	..	..	Line completes curve and begins straight stretch c. 8.5 km. long.
75.6	..	..	Line crosses road. Ditto
77.0	EMMENDINGEN	..	SER. Wb (35 t). Cr (6 t).
78.3	..	..	Embankment, c. 1 km. long.
79.4	TENINGEN-MÜNDINGEN	..	Passenger station.
80.9	..	..	Line crosses road.
83.4	KONDRINGEN	..	SER. Wb (25 t). Cr (6 t).
83.8	..	Bridge over main road.	Line begins wide curve NW.
84.0	RIEDER (REICHEN.)	..	SER. Wb (35 t). Cr (4 t). J (triangular) with ST s.o. Kaiserstuhlbahn lines to— (1) Gottenheim (distance 15.3 km., Route 111a). (2) Breisach (distance 26.4 km., Route 111a). Line completes curve, and begins straight stretch c. 8.5 km. long.
85.2	..	Bridge over R. Elz.	..
85.3	..	..	Line crosses road.
85.4	..	..	Line crosses main road.
85.5	..	..	Line crosses road.

Km.	Stations	Engineering works.	Details and facilities
88.7	KENZINGEN	..	SER. Wb (35 t). Cr (6 t). Embankment, c. 2.2 km. long.
88.9	..	..	..
91.0	..	Bridge over road.	Line crosses road.
91.4	..	..	..
92.3	HEBOLDENHEIM (BREMENAU)	..	SER. Wb (35 t). Cr (6 t). Line turns NE and begins straight stretch c. 2.4 km. long.
94.3	..	..	..
94.9	FRIEDENHEIM	..	SER. only 7 m. long. Wb (25 t). Cr (6 t). Line crosses road.
97.2	..	Bridge or culvert over stream (Euen).	..
97.9	ORSCHWEIER	..	SER. Wb (25 t). Cr (4 t). J (trailing) right, with ST s.o. DE line from Etten-Heimmünster (distance 7.8 km.). Line crosses minor road. Embankment, c. 3.3 km. long.
99.7	..	..	..
101.0	..	..	..
101.8	KIPPENHEIM	..	SER. Wb (25 t). Cr (4 t). Line crosses main road.
102.1	..	..	J (trailing) right, with ST s.o. DE line from Lahr (distance c. 2.5 km.).
102.0	..	..	..
106.2	LAHR-DINOLINGEN	..	SER. Wb (25 t). Cr (6 t). I with metre-gauge line to Kehl (distance 32.1 km.). Line crossed by metre-gauge line from Kehl to Seelbach (distance 42.0 km.). Line crosses main road. Line crosses road. Embankment c. 6.5 km. long.
106.6	..	Rail overbridge.	..
107.9	..	..	..
108.3	..	..	..
108.4	..	..	..
109.2	..	Bridge or culvert over stream (Sand).	Line crosses main road.
110.9	..	..	..
111.0	FRIESENHEIM (BADEN)	..	SER. Wb (40 t). Cr (6 t).
113.5	..	Bridge or culvert over stream (Dorf). Road overbridge.	..
113.7	..	..	..
114.2	..	Bridge or culvert over stream (Mittel).	..
114.9	..	Bridge over tributary of R. Schutter.	Line crosses road.
115.0	NIEDERSCHOPFHEIM	..	SER. Wb (25 t). Cr (4 t). Line crosses road.
116.9	..	..	Ditto
117.5	..	..	..
119.6	SCHUTTERWALD-REICHEN.	..	Passenger station. Line gradually curves E.
120.1	..	..	..
121.5	..	Bridge over main road.	..
121.9	..	Bridge over R. Kinzing.	..
122.1	..	Bridge over R. Mülhthall.	..
122.7	..	..	Line curves N.
123.1	..	..	J (trailing) right, with DT s.o. line from Villingen (Route 112).
123.2	..	Road overbridge.	..
123.8	..	Ditto	..
123.9	..	..	J (facing) left, with loop-line to MV, avoiding station. Line curves NE.

Km.	Stations	Engineering works	Details and facilities
*124.2	OFFENBURG	..	SER. Wb (60 t). Cr (10 t). MY, capacity c. 3,200 wagons per 24 hours. ES. W. For air photograph of Offenburg, see Plan 35. I with metre-gauge line to Altenheim (distance 11.6 km.). J (facing) right, connection with line to MY.
*124.4	..	..	J (facing) right, with ST s.o. avoiding line to Windschlag, through MY.
124.7	..	..	J (trailing) left, with avoiding line mentioned at 123.9 km.
126.6	..	Road overbridge.	Line passes over ST avoiding line from MY.
128.1	..	Fly-over.	Line crosses road.
128.8	..	..	..
129.0	WINDSCHLAG	..	SER. Wb (25 t). Cr (4 t).
129.5	..	Road overbridge.	Embankment, c. 1.3 km. long.
130.4	..	..	J (triangular) with—
131.2	..	Bridge over main road.	(i) DT s.o. line to Kehl (distance 13.5 km., Route 75).
131.6	..	..	(2) DT s.o. line to Rastatt (distance 40.4 km., Route 75).
132.2	APPENWEIER	..	SER. Wb (35 t). Cr (4 t). Line continues N to Karlsruhe as Route 75.

ROUTE 111A COLMAR-FREIBURG

General Description

Although only ST, this route is of some strategic importance in providing one of the few crossings of the Rhine connecting the Basel-Mulhouse-Strasbourg-Luxembourg line (Route 5, I.S.T.D. C/320) on the French side of the Rhine with the Basel-Appenweiler-Karlsruhe line (Routes 111 and 75) on the German side.

There are no steep gradients, the greatest being 1 in 84, and the minimum radius of curves is 600 m.

The line is particularly vulnerable from the point of view of bridges, the most important being that over the Rhine at 20 km.

General Details

- Gauge: 1,435 mm. (4 ft. 8½ in.). Standard.
- Length: 43.4 km. (26½ miles).
- Track: Single.
- Maximum permissible axle load: 16 metric tons.
- Maximum gradient: 1 in 84.

- Minimum radius of curves: 600 m.
- Traction: Steam.
- Maximum distance between stations: 8.0 km. (Colmar-Sandhofen).
- Engine sheds: Colmar. Freiburg.
- Marshalling yards: Colmar. Freiburg.
- Watering facilities: Colmar. Freiburg.
- Vulnerable points: Marked with asterisk in text.
(a) Locomotive sheds, marshalling yards and junctions at Colmar and Freiburg.
(b) Bridges at 4.2, 7.5, 10.0, 17.4, 20.0 (over Rhine), 20.5, 24.0, 25.0 and 35.2 km.
- Capacity:
Daily: 100. Net tonnage: 1,000.

Distance from Colmar

Km.	Stations	Engineering works	Details and facilities
0.0	COLMAR		<p>Passenger Station: No details available.</p> <p>Goods Depot: c. 600 m. S of station and E of line.</p> <p>SER. Wb. Cr. No details of siding accommodation.</p> <p>Loco. Depot: S of station and W of line, comprising 2 ES (half RH type) served from Tbls (diameter not known) and accessible from N and S.</p> <p>Marshalling Yard: S of loco. depot and W of line and bounded on W side by Route 111A. Large group of LS (average length c. 700 m.). No further details.</p> <p>J with—</p> <p>(1) DT s.o. line to Mülhausen (Mulhouse), distance 42.5 km. (Line 2 (b), I.S.T.D./Tn/408, and Route 5, I.S.T.D./C/350).</p> <p>(2) DT s.o. line to Strasbourg, distance 65.8 km.</p> <p>(References as above.)</p> <p>(3) ST s.o. line to Metzeral (distance 24.6 km.).</p> <p>(4) ST s.o. line to Ensisheim and Bollwiller (on Line 2 (b) and Route 5, as above. Distance 34.2 km.). The Bollwiller line runs in parallel track with Route 111A for 3.5 km.</p> <p>I with—</p> <p>(1) Metre-gauge ST s.o. DE line to Schnierlach (Lapouroye), distance 20.4 km.</p> <p>(2) Metre-gauge ST s.o. DE line to Wintz, distance c. 5 km.</p> <p>(3) Metre-gauge ST s.o. line to Strasbourg (distance c. 77.0 km.).</p>
0.4	..	Road overbridge.	
0.6	..	Ditto	Line curves ESE on a curve of radius 600 m., length 1000 m.
1.1	..	Ditto	
1.4	..	Overbridge (rail and road).	Line passes under DT s.o. line to Mülhausen (see above).
1.7	..	Road overbridge.	Line passes under main road, and curves SE.
1.9	Line begins straight stretch c. 12 km. long.
2.1	..	Culvert over stream.	
2.2	..	Road overbridge.	
2.4	..	Culvert.	
2.5	..	Bridge over stream (Lauch).	
2.6	..	Bridge over stream.	
3.5	..	Bridge over stream.	J (facing) right, with ST s.o. line to Ensisheim and Bollwiller (distance 34.2 km.).
4.0	Line enters Colmar Wood (Bois de Colmar), through which it runs for 2.3 km.
4.2	..	Bridge over canal of R. Lauch.	
5.7	NEULAND	..	Passenger halt.
6.3	Line crosses road.
6.5	..	Road over R. Ill.	Line crosses main road.
8.5	SUNDHEIM	..	SER.
10.0	Line enters Colmar Forest (Bois de Colmar), through which it runs for 2.3 km.

Km.	Stations	Engineering works	Details and facilities
13.1	Line crosses main road.
13.4	Line ends straight stretch, and curves SE.
14.4	WOLFGANTZEN	..	Passenger station.
*16.0	..	Bridge over Widensolen Canal.	..
16.4	..	Bridge over road.	Line crosses main road.
16.7
16.9	NEUP-BREBACH VILLE (NEUBREBACH STADT)	..	Passenger station.
17.0	..	Ditto	Line curves E.
17.2	Line crosses road.
*17.4	..	Bridge over Rhein-Rhone Canal.	..
17.9	NEUP-BREBACH GARE (NEUBREBACH BF)	..	SER. Wb. Cr. W.
18.3	..	Bridge over lane.	..
18.6	Line crosses road.
18.7	J (facing) right, with ST s.o. line to Bantzenheim, distance 25.1 km.
18.9	..	Bridge over stream.	..
19.0	..	Bridge over road.	..
19.2	..	Bridge over river.	..
19.3	..	Ditto	..
19.5	Line crosses road and curves NE, radius of curve c. 800 m.
19.8	..	Bridge over stream.	..
*20.0	..	Bridge over R. Rhein.	Total length: 345.6 m. Spans: 3 x 70 m. + 4 x 27 m. Height: 5.6 m. ST. Built 1876/77. Construction: 3 main parallel braced girder through spans on stone piers; 4 braced girder semi-through side sp. ns.
*20.5	..	Bridge over arm of R. Rhein.	..
20.7	Line crosses road.
20.9	BREBACH	..	SER. Wb (35 t). Cr (4 t). W. Former French frontier station. J with ST s.o. DE line to N of town, c. 1.2 km. long.
21.3	J (facing) left, with ST s.o. line to Riegel. (On Route 111. Distance, 26.4 km., "Kaiserstühlbahn.")
21.6	Line turns ENE and begins straight stretch c. 9 km. long.
22.8	Line crosses main road.
*24.6	..	Bridge over canal.	..
*25.0	..	Ditto	..
25.4	Line crosses main road.
25.6	IHRINGEN	..	SER. Wb (25 t). Cr (4 t).
28.3	Line crosses main road.
28.4	WASENWEILER	..	SR. Wb (25 t). Cr (3 t).
29.3	Line crosses road.
29.7	Embankment c. 0.8 km. long.
31.0	Line crosses swampy meadows.
31.6	GOTTENHEIM	..	Line turns E.
31.8	SER. Wb (25 t). Cr (2 t).
32.0	J (trailing) left, with S.T. s.o. line to Riegel. (On Route 111. Distance 15.3 km. "Kaiserstühlbahn.")
32.0	..	Bridge or culvert over stream.	..
34.6	Embankment, c. 1.3 km. long.
*35.2	..	Bridge over Dreisam Canal.	..
35.4	Line curves SE and begins straight stretch c. 5 km. long.

Km.	Stations	Engineering works	Details and facilities
35.9	HUGATETTES	..	SER. Wb (40 t).
37.1	..	Bridge over road.	Line crosses main road.
40.0	..	Road overbridge.	..
41.3	..	..	J (facing) right and left, with DT s.o. line Basel-Freiburg (HgbM)-Appenweiler (Route 111).
41.6	..	Bridge over railway.	Line passes over DT line Basel-Appenweiler (Route 111). Line curves S.
43.3	FREIBURG (BREMGAU) Hbf	..	SER. Wb (40 t). ES (rectangular). Tbl. W. SV. For location diagram see Plan 47. J for DT s.o. line Basel-Appenweiler (Route 111) and ST electrified line to Donaueschingen (Route 111a).

ROUTE 111B

FREIBURG-NEUSTADT-DONAUESCHINGEN (HOLLENTAL BAHN)

General Description

Linking the Rhine at Freiburg (Route 111) with the Danube at Donaueschingen (Route 112) this line is one of the most heavily graded in Germany.

Originally, a Klose rack section was employed between Hirschsprung and Hinterzarten where the heaviest grades of 1:18 obtain, but the rack was dispensed with upon electrification of the line. Length of the rack section was 7.2 km. (4½ miles), the culminating point, between Holsteig and Hinterzarten, being 893 m. (2,930 ft.) above sea level or 624 m. (2,047 ft.) above the starting point.

Power is obtained from the industrial supply at 50 cycles through Scott-connected transformers at Titisee, the tension of the contact wire being 20 K.V.; 2,000-h.p. electric locomotives have replaced the former 2-6-2, and 0-6-2 tank locomotives.

Engineering works include 12 tunnels of total length 2,091.1 m. and several bridges over rivers and streams, the most important being marked by an asterisk in the itinerary.

General Details

- GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
- LENGTH: 81.9 km.
- TRACE: Single.
Freiburg-Hüfingen (79.3 km.), single.
Hüfingen-Donaueschingen (2.6 km.), double.
- MAXIMUM PERMISSIBLE AXLE LOAD:
Freiburg-Neustadt, 20 metric tons.
Neustadt-Donaueschingen, 16 metric tons.

5. MAXIMUM GRADIENT:

Hirschsprung-Hinterzarten, 55 per mille (1 in 18).

Remainder of line, 25 per mille (1 in 40).

6. MINIMUM RADIUS OF CURVES: 225 m.

7. TRACTION: Electric between Freiburg and Neustadt—supply taken from industrial system at 30-K.V., 50-cycle, single-phase.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

Section Freiburg-Neustadt, 9.7 km.

Section Neustadt-J at Hüfingen, 6.7 km.

9. ENGINE SHEDS:

Freiburg. Villingen (on Route 112).

10. MARSHALLING FACILITIES: Freiburg.

11. WATERING FACILITIES: No details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Marshalling and locomotive facilities at Freiburg.

(b) Junctions at Freiburg, Titisee and Donaueschingen.

(c) Bridges, at 0.9, 1.0, 10.2, 10.7, 11.2, 33.0-35.0, 38.4, 46.9, 50.3, 58.2, 67.3, 68.4 and 77.7 km.

(d) Tunnels at 19.1, 26.8, 27.5, 48.9, 49.9 and 51.1 km.

(e) Electric sub-station at Titisee.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Throughout electric traction	12	100

(Line could not be effectively worked by steam traction unless rack section were re-introduced.)

Distance from Freiburg

Km.	Stations	Engineering works	Details and facilities
0.0	FREIBURG (BREMGAU) Altitude 269 m. (882 ft.)	..	SER. Wb (40 t). ES. (Rectangular). Tbl. J for main line Basel-Appenweiler-Karlsruhe (Route 111). For location diagram see Plan 47.
0.9	..	Bridge over Dreisam Canal.	..
1.0	..	Bridge over railway.	Line passes over DT s.o. line Basel-Appenweiler (Route 111). Line curves E.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
2.5	FRIBURG-WIEHRE	..	SR. Wb (50 t). Cr (4 t). Facilities for parcels traffic.
3.0	..	Bridge over road.	
4.0	REFF WÄLDEN	Ditto	Halt.
5.6	..	Ditto	
7.7	FRIBURG-LITTENWEILER	Ditto	SR. Wb (40 t).
6.6	..	Bridge or culvert over stream.	
7.3	..	..	Halt.
7.4	KAPPELERTAL	..	I with aerial cableway to Schauinsland.
8.6	..	Bridge over road.	
9.6	..	Ditto	
*10.2	..	Bridge over stream (Krummb).	
*10.4	..	Bridge over road.	
*10.7	..	Ditto	
10.9	KIRCHZARTEN Altitude 398 m. (958 ft.)	..	SER. Wb (40 t). Cr (4 t).
*11.2	..	Bridge over stream (Rot).	
11.4	..	Road overbridge.	Line turns SE.
12.0	..	..
13.4	..	Bridge over road.	
13.9	HIMMELREICH Altitude 455 m. (1,493 ft.)	..	SR. Wb (36 t). Line enters the hilly region of Hollental, following the main road to Neustadt.
18.2	HIRSCHSPRUNG Altitude 559 m. (1,834 ft.)	..	Passenger station with parcels facilities. c. 300 m.
*19.1	..	Tunnel.	
22.9	POSTHALDE Altitude 657 m. (2,156 ft.)	..	SR. Wb (33 t).
26.1	HÖLSTEN Altitude 816 m. (2,420 ft.)	..	Halt.
26.8	..	Bridge over road.	
27.3	..	Tunnel	c. 300 m.
*27.5	..	Ditto	
*28.3	..	Bridge over road and Ravenna Gorge.	222 m. long, 37 m. high.
32.6	HINTERSARTEN Altitude 883 m. (2,904 ft.)	..	SR. Wb (40 t). Passing facilities. Falling gradient to Donaueschingen. Trains from Donaueschingen normally change locomotives for the heavy grades to Freiburg.
*33.0	..	Bridge over river.	
*34.3	..	Ditto	
*35.0	..	Ditto	
*36.1	..	Bridge over road.	Electric power station.
*36.4	TITZEN Altitude 858 m. (2,813 ft.)	..	SR. Wb (40 t). J for ST electric line to Seebrugg (Route 1116).
*37.2	..	..	Line turns N and follows course of R. Gutach. J (facing) right with ST electric line to Seebrugg (Route 1116).
38.0	..	Bridge over stream.	
*38.4	..	Bridge over R. Gutach.	
39.3	HOLZLEIBRUCK	..	Halt. Facilities for dealing with "small" traffic up to 2,000 kg. Each light rail way to Rottenburg Line turns SE.

Km.	Stations	Engineering works	Details and remarks
42.0	NEUSTADT (SCHWARZ) (Altitude 805 m. (2,641 ft.))	..	SER. Wb (40 t). Cr. (4 t).
42.5	..	Bridge over road.	
43.1	..	Bridge over stream.	
46.3	KAPPEL GUTACHBRÜCKE	..	SR. Wb (35 t). J for ST s.o. local line to Lenskirch (6.7 km.) and Bonndorf (19.8 km.). J facing right with ST s.o. line to Lenskirch, etc.
46.8	..	..
46.9	..	Bridge over main road to R. Gutach.	
47.5	..	Road overbridge.	
48.1	..	Bridge over stream.	
48.7	..	Bridge over R. Gutach.	136 m. long, 37 m. high.
48.9	..	(?) Tunnel.	c. 250 m.
49.9	..	Tunnel.	Line bears N and follows valley of Rothenbach to Rothenbach.
50.3	..	Bridge over Rothenbach.	
51.1	..	Tunnel.	c. 200 m.
53.0	ROTHENBACH	2 bridges over roads.	SER. Wb (35 t). Line curves SE to follow valley of Trankbach to Bachheim.
57.8	..	Bridge over road.	
58.0	LÖFFINGEN	..	SER. Wb (35 t). Cr. (4 t).
58.2	..	Bridge over road and Trankbach.	
58.7	..	Bridge over road.	
59.5	..	Ditto	
60.3	REHLEFINGEN	Ditto	Halt.
61.1	..	Ditto	
63.4	BACHHEIM	..	SR. Wb (35 t). Line turns N with rising gradients to Unadingen.
64.9	..	Ditto	
65.3	..	Ditto	
65.9	UNADINGEN	..	SR. Wb (35 t).
66.9	..	Road overbridge.	
67.3	..	Bridge over Mauchach.	Line turns E.
67.7	..	Bridge over road.	
68.4	..	Bridge over R. Mauchach.	
70.7	..	Road overbridge.	
71.2	DÖGGINGEN	..	SR. Wb (35 t).
73.1	..	Bridge or culvert over stream.	
74.6	HAUSEN VOR WALD	..	SR. Wb (35 t).
74.9	..	Bridge over road. Bridge or culvert over stream.	Line turns N.
76.1	..	Bridge over stream.	
76.9	..	Bridge over road.	
77.3	..	Road overbridge.	
77.7	..	Bridge over Brandbach.	
78.4	..	Ditto	
79.1	..	Road overbridge.	
80.1	..	..	J (on right) left, with ST s.o. local railway from Furtwangen (Freig- taxis). Distance from H. fin- gen 20.4 km. Line to D. D. to Donauwörth 2.0

Km.	Stations	Engineering works	Details and facilities
77.3	HUPFEN (BARENTAL)		SR. Wb. (35 t).
79.8	..	Bridge over road.	J (trailing) right with ST line
81.3	..	..	Singen-Offenburg (Route 112).
		Bridge over road.	
81.9	DONAUSCHINGEN	..	SER. Wb (40 t). Cr. (6 t).

ROUTE 111C TITISEE-ST. BLASIEN-SEEBRUGG

General Description

This ST electrified line (the Dreiseenbahn), runs SW from Titisee along the E shore of Lake Titisee to Barental (near the Feldberg), and thence runs along the valleys of several streams feeding the series of lakes in the area to Titisee.

The line is of little importance from a military point of view, but is of interest inasmuch as at Barental it reaches an altitude of 1,030 m. (3,379 ft.), the highest point reached by a standard gauge railway in Germany.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 19.1 km. (6½ miles).
3. TRACK: Single.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 18 metric tons.
5. MAXIMUM GRADIENT: 30 per mille (1 in 30).

6. MINIMUM RADIUS OF CURVES: 225 m.

7. TRACTION: Electric; 20-K.V., 50 cycles, single-phase, from industrial system of area.

8. MAXIMUM DISTANCE BETWEEN STATIONS: 7.6 km.

9. ENGINE SIZES: No details.

10. MARSHALLING FACILITIES: No details.

11. WATERING FACILITIES: No details.

12. VULNERABLE POINTS:

- (a) Electric transformer station at Titisee.
- (b) Junction at Titisee.
- (c) Bridge at 1.2 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Electric traction	12	250
Steam traction	8-10	200

Distance from Titisee

Km.	Stations	Engineering works	Details and facilities
36.4	FREIBURG	Route 111B.	
0.0	TITISEE	..	Electric transformer station. SER. Wb (40 t). Line runs common with Route 111B to J.
0.8	..	..	J (facing) left, with ST line to Donaueschingen (Route 111B). Line curves SE from J round E side of Lake Titisee to Barental.
1.2	..	Bridge over R. Gutach.	
2.0	..	Bridge over main road.	
7.6	BARENTAL (FELDBERG)	..	SR. Wb (40 t). Line curves SW.
9.3	..	Road overbridge.	
9.6	ALTGLASHUTTEN-FALKAU	..	SR. Wb (40 t).
10.6	..	Road overbridge.	Line skirts E side of Lake Windgfall Weiher.
11.7	..	Ditto	
12.1	..	Bridge or culvert over stream.	
13.3	ANA	..	SR. Wb (40 t).
13.8	..	Road overbridge.	
14.6	..	..	Line runs along E. shore of Schluchsee.
17.2	SCHUCHSE	..	Wb (40 t). SR.
18.6	..	Bridge over road. Small road over bridge.	
19.1	SEEBRUGG	..	SER. Wb (40 t). Cr. (40 t). Terminus station.

Km.	Stations	Engineering works	Details and facilities
77.3	HÜPINGEN (BARENTAL)		SR. Wb. (35 t).
79.8	..	Bridge over road.	J (trailing) right with ST a.o. line
81.3	..	..	Singen-Offenburg (Route 112).
		Bridge over road.	
84.9	DONAUSCHINGEN	..	SR. Wb (40 t). Cr. (6 t).

ROUTE 111C

TITISEE-ST. BLASIEN-SEEBRUOG

General Description

This ST electrified line (the Dreiseenbahn), runs SW from Titisee along the E shore of Lake Titisee to Barental (near the Feldberg), and thence runs along the valleys of several streams feeding the series of lakes in the area to Titisee.

The line is of little importance from a military point of view, but is of interest inasmuch as at Barental it reaches an altitude of 1,030 m. (3,379 ft.), the highest point reached by a standard gauge railway in Germany.

General Details

1. GAUGE: 1457 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 19.1 km. (6½ miles).
3. TRACK: Single.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 18 metric tons.
5. MAXIMUM GRADIENT: 30 per mille (1 in 30).

6. MINIMUM RADIUS OF CURVES: 225 m.

7. TRACTION: Electric; 30-K.V., 50 cycles single-phase, from industrial system of area.

8. MAXIMUM DISTANCE BETWEEN STATIONS: 7.6 km.

9. ENGINE SIZES: No details.

10. MARSHALLING FACILITIES: No details.

11. WATERING FACILITIES: No details.

12. VULNERABLE POINTS:

- (a) Electric transformer station at Titisee.
- (b) Junction at Titisee.
- (c) Bridge at 1.2 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Electric traction	12	250
Steam traction	8-10	200

Distance from Titisee

Km.	Stations	Engineering works	Details and facilities
36.4	FRIEDBURG	Route 111B.	
40	TITISEE	..	Electric transformer station. SR. Wb (40 t). Line runs common with Route 111B to J.
40.8	..	..	J (facing) left, with ST line to Donauschingen (Route 111B). Line curves SE from J round E side of Lake Titisee to Barental.
41.2	..	Bridge over R. Gutach.	
42.0	..	Bridge over main road.	
7.6	BARENTAL (FELDBERG)	..	SR. Wb (40 t). Line curves SW.
9.5	..	Road overbridge.	
9.6	ALTGLASHUTTEN-FALKAU	..	SR. Wb (40 t).
10.6	..	Road overbridge.	Line skirts E side of Lake Windgfall Weiher.
11.7	..	Ditto	
12.1	..	Bridge or culvert over stream.	
13.3	ANA	..	SR. Wb (40 t).
13.8	..	Road overbridge.	
14.6	..	..	Line runs along E. shore of Schluchsee.
17.2	SCHLUCHSEE	..	Wb (40 t). SR.
18.6	..	Bridge over road. Small road overbridge.	
19.1	SEEBRUOG	..	SFR. Wb (40 t). Cr (10 t). Terminus station.

ROUTE 111D
MULHOUSE-NEUBURG-MÜLLHEIM

General Description

Although ST for most of its length, this line is of considerable importance in providing one of the crossings of the Rhine, connecting the main Basel-Luxemburg line on the French side to the Basel-Karlsruhe line on the German side.

Gradients and curvature are negligible.

The route takes a general direction NE, crossing the Rhine at 17.5 km., and joining the Basel-Karlsruhe line by a trailing connection at 21.4 km.

General Details

1. GAGES: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 23 km. (14½ miles).
3. TRACK:
 - Mulhouse-Ile-Napoleon (4.5 km.), double.
 - 4.5 km.-J at 21.4 km. (16.9 km.), single.
 - 21.4 km.-23.0 km. (1.6 km.), double.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
 - Mulhouse-Neuburg, 20 metric tons.
 - Neuburg-Müllheim, 16 metric tons.
5. MAXIMUM GRADIENT: 3 per mille (1 in 300).
6. MINIMUM RADIUS OF CURVES: 450 m.

7. TRACTORS: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 6.1 km. (3½ miles).
9. ENGINE SHEDS:
 - Mulhouse-Nord.
 - Ile-Napoleon.
10. MARSHALLING YARDS: Mulhouse-Nord.
11. WATERING FACILITIES:
 - Mulhouse.
 - Bantsenheim.
12. VULNERABLE POINTS: Marked with asterisk in text.
 - (a) Marshalling and locomotive facilities at Mulhouse.
 - (b) Repair shops at Mulhouse.
 - (c) Junctions at Mulhouse, Bantsenheim and Müllheim.
 - (d) Bridges at 2.9, 4.5, 4.8 and 17.5 km., the latter over the Rhine being most important.
13. CAPACITY:

Trains per day each way	Net train load ton military stores
12	400

Distance from Mulhouse Ville

Km.	Stations	Engineering works	Details and facilities
0	MULHOUSE-VILLE	..	<p>ES. Tbl. W (water tower capacity 500 m.³). RPS (vagnons). SER. Wb. Cr. MY (Mulhouse N.).</p> <p>12 through tracks (9 passenger, 3 goods lines) converging to 9 roads NE of station, 2 for Neuburg line, 2 for loco. depot at Ile-Napoleon, 1 to Mulhouse Nord MY, 4 for Basel line.</p> <p>Passenger Station: 4 island platforms, c. 300 m. long.</p> <p>Carriage Sidings: 2 groups of LS: 1 x 6 (c. 300-450 m.). 1 x 7 (c. 350-450 m.).</p> <p>Goods Station: E of station, N of line (Mulhouse Wanne):</p> <p>6 LS (100-250 m.) for storage, 2 DES (150-200 m.) serving goods sheds, 6 DES (100-350 m.) with road access and serving SER.</p> <p>Storage Sidings: S of line, c. 10 DES (c. 350 m.). 4 DES (c. 200 m.). 4 DES (c. 150 m.). 4 DES (c. 500 m.), all adjoining old loco. depot, which from air cover (May, 1944) appears to have been removed.</p> <p>RPS (Wagen): c. 1.5 km. E of station, S of line, equipped to deal with all heavy repairs—total personnel employed c. 1,000.</p> <p>Loco. Depot: The old ES shown on Plan 10 as S of station has been removed—a further depot exists at Ile-Napoleon, comprising large RH, Tbl, workshops and for running repairs, overhauled trucks in open, large coal dump equipped with mechanical shovel and power trucks, etc.</p>

Km.	Stations	Engineering works	Details and facilities
			<p>Marshalling Yard at Mulhouse Nord. Hump type mechanically operated.</p> <p>Reception Sidings: W end, c. 15 LS (c. 1,000 m.), including running roads, connected at E end to a group of 15 for marshalling, each group consisting of 15 LS (c. 900-1,000 m.).</p> <p>Serving Sidings: c. 10 LS, 400-450 m.</p> <p>Departure Sidings: c. 15 LS, c. 600 m. long. Tranship shed.</p> <p>Customs Shed: SE of yard, served by 7 DES each (c. 250-300 m.).</p> <p>Loc. Depot: S of MV. Maintenance capacity, 100-150 locos. 2 RM, each with c. 15 covered tracks and 15 stalling tracks in open; 2 TM (25 and 30 m.). Coal dump with mechanical coaling plant E of depot.</p> <p>For location diagram of Mulhouse, see Plan 50.</p>
0.3	..	Road overbridge.	Pont du Tivoli.
1.0	MULHOUSE-WAHRN	..	Goods station—for details see main station.
1.1	..	Overbridge.	Footpath.
1.8	..	..	Connection trailing right with Rps.
1.9	..	..	Line to Basel branches to right.
2.1	..	Road overbridge.	Line passes under DT line from MV.
2.9	..	Rail overbridge.	DT line to Ile-Napoleon branches away to right.
3.2	..	..	..
4.5	ILE-NAPOLEON	..	W. Wb. Cr. End of DT section beginning of ST section.
4.6	..	Bridge over road.	..
4.8	..	Bridge over canal de Muningue.	Line enters Forest de la Harth and runs on a straight and level section to Bantzenheim.
4.9	..	..	..
5.6	..	Bridge over road.	..
9.9	..	Bridge over drainage canal.	..
10.6	GRÜN HUTTE	..	..
13.9	..	Bridge over small canal.	..
14.4	BANTZENHEIM	..	SR. Wb. Cr. c. 3 LS (c. 400 m.), S of line. J. (facing) left, with ST s.o. line to Neuf-Brisach on Route 111A—distance 25.1 km.
14.9	..	..	..
15.9	..	Bridge over stream (Mulbach).	..
16.9	..	Bridge over track.	..
17.0	CHALAMPE	..	Halt.
17.5	..	Bridge over R. Rhine.	Total length, 330.6 m.—consisting of 2 bridges: Old Bridge: span 1 x 70 m. span 4 x 27 m. New Bridge: span 1 x 20 m. span 4 x 27 m. Height, 7.5 m. The bridge is a steel truss bridge with a central span of 70 m. and four side spans of 27 m. each. The bridge is supported by concrete piers and has a total length of 330.6 m.

Km.	Stations	Engineering works	Details and facilities
18-6	..	Bridge over stream.	piers, with 4 braced girder viaduct through side spans. The 2 tracks over these bridges are connected by switches on each bank into single track.
19-0	Neumunster	..	Former French frontier station. ER. Wb (40 t). Cr (4 t).
19-4	..	Bridge over road.	
21-0	..	Bridge over lane.	
21-4	..	..	J (trailing) right, with DT s.o. line from Basel (Route 111).
23-0	MÖLLERSIM (BADEN)	..	Line curves N. SER. Wb (35 t). Cr (6 t). Line continues N to Freiburg, Appenweier and Karlsruhe as Route 111.

ROUTE 111

OFFENBURG-HAUSACH-VILLINGEN-DONAUESCHINGEN-IMMENDINGEN-SINGEN-RADOLFSZELL-KONSTANZ

General Description

This line, which includes the Black Forest Railway, by-passes the bend of the Rhine and provides the most direct service to Konstanz from the Karlsruhe direction, although the Basel route is mostly favoured owing to the heavy gradients on the other, particularly between Hornberg (42-6 km.) and Numbach (63-7 km.) where in order to cross the mountain range a double spiral including 37 tunnels of a total length 9,535 m. is involved, as well as many bridges over rivers and streams. Principal junctions are: Offenburg for the Basel-Appenweier line (Route 111); Hausach for the line to Eutingen (Route 1180); Donaueschingen for the line to Freiburg (Route 1116); Immendingen for the lines to Herb and Sigmaringen; Singen for DT s.o. line to Schaffhausen and ST s.o. to Stein (Switzerland); Radolfszell for the line to Friedrichshafen (Route 117); Konstanz for lines running into Switzerland. The line runs through the Black Forest following the R. Kinzig to Hausach, after which it runs in the valley of the R. Gutach to Sommerau. From Donaueschingen the line runs in the valley of the R. Donau, over which there are 2 bridges, i.e. at 111-9 km. and 119-7 km.; at Konstanz the R. Rhein is crossed. Gradients are severe, mainly rising ones to Sommerau and falling ones from there to Konstanz.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 179-4 km. (111½ miles).
3. TRACK:
 - Offenburg-Villingen (85-9 km.), double.
 - Villingen-Immendingen (33-1 km.), single.
 - Immendingen-Konstanz (60-4 km.), double.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
 - Offenburg-Radolfszell, 20 metric tons.
 - Radolfszell-Konstanz, 18 metric tons.

5. MAXIMUM GRADIENT: 30 per mille (1 in 50).
6. MINIMUM RADIUS OF CURVES: 300 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS:
 - 9-2 km. (5½ miles).
 - Hornberg 42-6 km.-Niederwasser 51-8 km.
9. ENGINE SHEDS:

Offenburg.	Singen.
Hausach.	Radolfszell.
Villingen.	Konstanz.
10. MARSHALLING YARDS: Offenburg.
11. WATERING FACILITIES: As in 9 above. No other details.
12. VULNERABLE POINTS:
 - (a) Marshalling and locomotive facilities given in 9 and 10 above.
 - (b) Repair shops at Offenburg.
 - (c) Junctions at Offenburg (1-0 km.), Hausach (33-2 km.), Villingen (86-7 km.), Donaueschingen, Hinterschingen, Immendingen, Singen.
 - (d) Bridges at 21-3, 31-8, 36-0, 68-6, 73-3, 80-3, 80-9, 89-2, 89-3, 97-8, 100-9, 111-9 (over Danube), 119-7 (over Danube), 148-5 and 178-4 km. (over Rhine).
 - (e) Tunnels at 31-8 and 68-6 km.
13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Offenburg-Villingen	48	200
Villingen-Immendingen	12-16	200
Immendingen-Konstanz	48	200

RAILWAYS

Distance from Offenburg

Km.	Stations	Engineering works	Details and facilities
143.6	MANNHEIM	Routes 111, 75, and 67.	
71.0	KARLSRUHE-DURLACH	Rn 111 and 75.	
8.0	APPENWEIER	Route	J for DT s.o. line from Appenweier to Basel (Route 111).
0.0	OFFENBURG	..	SER. Wb (80 t). Cr (10 t). ES. Rps (1000); estimated total staff 2,200 (includes generating staff at Durlach). MY, capacity 3,200 wagons per 24 hours. For air photograph of Offenburg, see Plan No. 35. I for narrow-gauge line (1 m.) to Kehl (26.1 km.) and Seelbach (b. Lahr) (39.1 km.). Line follows valley of the R. Kinzig.
0.1-0	..	2 road overbridges. Road overbridge.	J (facing) right, with DT s.o. line to Basel (Route 111).
2.7	..	Bridge or culvert over stream.	
3.2	..	Ditto	Line crosses road just before station.
4.1	ORTENBURG (BADEN)	..	SER. Wb (25 t). Cr (2 t).
5.0	..	Ditto	
5.8	..	Ditto	Just before station.
6.6	OHLSBACH	..	Restricted goods facilities. (Packages up to 100 kg.)
7.7	..	Ditto	
8.4	..	Ditto	
8.6	..	Ditto	
9.5	GENGENBACH	..	SER. Wb (40 t). Cr (6 t). After station.
10.7	..	Road overbridge. Bridge or culvert over stream.	
11.8	..	Ditto	Line crosses small road before station.
13.0	SCHÖNBERG (b. OFFENBURG)	..	Restricted goods facilities. (Packages up to 200 kg.) Line crosses several minor roads.
17.9	BIBERACH (BADEN)	..	SER. Wb (35 t).
18.4	..	..	J (facing) left, with ST s.o. local DE line to Oberharmersbach-Rienbach (10.6 km.).
18.6	..	Bridge or culvert over stream.	
19.1	..	Ditto	
19.8	..	Ditto	Line crosses main road to Steinach.
20.1	..	Ditto	
21.3	..	Bridge over R. Kinzig.	Line crosses several small roads. Just before station.
21.7	STEINACH (BADEN)	..	SER. Wb (35 t). Line curves SE. Line crosses road. Line crosses main road to Hausach just before Hausach station.

Km.	Stations	Engineering works	Details and facilities
25.1	HAMACH	Bridge or culvert over stream.	SER. Wb (35 t). Cr (6 t). By station. Line crosses small road after station, returns E. Line crosses small road. Line crosses main road.
31.7	..	..	..
32.3	..	..	..
33.2	HAUTACH	..	SER. Wb (35 t). Cr (4 t). ES. J (facing) left, with ST s.o. line to— Eutingen (Wurt.) (c 68.9 km.) (Route 1120) on the DT s.o. Horb-Stuttgart line. The Black Forest line leaves the valley of the R. Kinzig, turns towards the S, and enters the valley of the R. Gutach.
33.2	..	..	..
34.0	..	Bridge or culvert over stream.	..
34.3	..	Ditto	..
35.2	..	Ditto	..
36.6	..	Ditto	..
36.9	GUTACH (SCHWARZ- WALDBAHN)	..	SER. Wb (25 t). Line crosses main road after station. There are many bridges or culverts over streams on this section of the line. Line runs SSE to Hornberg. Bridge over valley and main road. 175 m. long, 24 m. high.
42.1	..	..	..
42.6	HORNBERG	..	SER. Wb (35 t). Cr (4 t). Between Hornberg and Nussbach the mountain range is crossed by means of a double spiral and a helical tunnel, with some 1 in 50 gradients. There are 37 tunnels of a total length of 9,335 m.
51.8	NIEDERWASER	..	Passenger station. Shortly after Niederwaser the line crosses a road. After road. First of the double spiral tunnels begins. Between Niederwaser and Triberg.
..	..	Bridge over R. Gutach.	..
..	..	3 long tunnels.	..
56.0	TRIBERG	..	SER. Wb (35 t). Cr (6 t). After leaving Triberg station. Line crosses road. Line curves sharply north after Triberg and enters a long tunnel. Between Triberg and Nussbach.
..	..	Bridge over R. Gutach.	..
..	..	3 long tunnels.	..
63.7	NUSSBACH	..	Passenger station. Soon after Nussbach. Line crosses road.
..	..	Long tunnel.	..
..	..	Road overbridge. Sommerau tunnel.	..
68.6	SOMMERAU (SCHWARZ- WALDBAHN)	..	Very long tunnel. Restricted goods facilities. Sommerau is on the water shed between the Rhine and the Danube. Line runs SE. Crossing small road. Line now runs in the valley of the R. Gutach. Line crosses R. and then NE. to St. Gallen.
..	..	Road overbridge. Bridge over R. Gutach.	..

Km.	Stations	Engineering works	Details and facilities
71.3	ST. GEROEN (SCHWARZWALDBAHN)	..	SER. Wb (25 t). Cr (2 t).
72.5	..	Bridge or culvert over stream.	
*73.3	..	Bridge over R. Brigach.	
73.5	..	Bridge or culvert over stream.	
73.7	..	Ditto	Line crosses minor roads.
74.4	..	Ditto	Line runs SE to station.
75.2	PETERZELL-KÖNIGSWELD	..	SER. Wb (35 t).
75.5	..	Bridge or culvert over stream.	
			Line crosses 2 small roads.
*80.3	..	Bridge over R. Brigach.	
*80.9	..	Ditto	Line crosses road before station.
81.8	KIRMACH-VILLINGEN	..	SR. Wb (25 t). Cr (2 t).
		Road overbridge.	Line crosses several roads. Before station.
*83.9	VILLINGEN (SCHWARZWALDBAHN)	..	SER. Wb (60 t). Cr (4 t).
		Road overbridge.	ES. DT section ends.
*86.7	..	..	J (facing) left, with ST s.o. line to Rottweil (26.1 km.) on the s.o. line from Immendingen to Horb which is partly ST and partly DT. Line runs S to Klengen. Line crosses minor road.
88.8	MARBACH (BADEN)	..	SER. (only 7 m. long). Wb (35 t). S of station.
		..	J (facing) left, with ST s.o. DE line to Bad Dürrenheim (5.7 km.). Line crosses minor road.
*89.2	..	Bridge over arm of R. Brigach.	
*89.3	..	Ditto	
			Line crosses minor road before station.
91.4	KLENGEN	..	SR. Wb (25 t).
			Line crosses 2 minor roads.
94.3	GRÜNINGEN	..	SR. Wb (25 t).
			Line crosses minor road after sta- tion.
96.8	AUFEN	..	Passenger station. Line curves SE.
*97.6	..	Bridge over R. Brigach.	
98.0	..	..	Line curves S. Line crosses minor road. Line runs SE into station.
99.7	DONAUSCHINGEN	..	SER. Wb (40 t). Cr (6 t).
			Line crosses minor road.
*100.2	..	..	J (facing) right, with ST s.o. line to Freiburg (31.4 km.), Route 1115.
100.3	..	Bridge or culvert over stream.	
*100.9	..	Bridge over R. Brigach.	
101.1	..	Bridge or culvert over stream.	Line now runs in the valley of the R. Neckar (D. 101.1).

Km.	Stations	Engineering works	Details and facilities
101.5	..	Bridge or culvert over stream.	Line crosses minor road.
102.3	..	Ditto	
103.5	PROHREN	..	SER. Wb (40 t). Line crosses secondary road.
104.2	..	Ditto	
105.9	..	Ditto	
106.3	NEUDINGEN	Bridge over arm of R. Donau.	SER. Wb (40 t).
107.2	..	Ditto	
107.5	..	Bridge or culvert over stream.	Line crosses minor road before station.
110.2	GUTMADINGEN	..	SER. Wb (35 t). Line runs ENE.
111.5	..	Ditto	
*111.9	..	Bridge over R. Donau.	Line crosses main road.
113.0	GEISINGEN	..	SER. Wb (25 t).
*115.3	..	..	J (trailing) right, with ST a.o. line from Oberlauchringen (61.2 km.) (max. axle load 14 t) on Route 113b. Line crosses minor road.
115.8	HENTSCHINGEN	..	Restricted goods facilities. Line crosses minor road at station. Line crosses minor road.
117.7	..	Bridge or culvert over stream.	
119.0	IMMENDINGEN	..	SER. Wb (35 t). ST section of line ends. Beginning of DT.
119.4	..	Bridge or culvert over stream (Weissen).	
*119.5	..	..	J (facing) left, with line to Stuttgart (Route 114) and line to Sigmaringen.
*119.7	..	Bridge over R. Donau.	Line crosses road and curves SE. Line curves ENE.
121.4	..	..	J (trailing) left, with connection from Route 114 and line from Sigmaringen.
*122.3	..	..	Line leaves valley of the R. Donau, curves right and runs S to Hattingen.
123.6	HATTINGEN (BADEN)	..	SER. Wb (25 t).
124.0	..	Tunnel.	c. 800 m. long.
126.0	..	..	Line curves SE. Line crosses road.
129.1	..	..	Line curves S.
130	TALLMÜHLE (BADEN)	..	SER. (only 7 m. long). Wb (35 t). Line crosses minor road at station.
130.2	..	..	Line curves SW.
133.3	..	..	Line curves S and then SSW to Engen. Line crosses minor road.
134.6	ENGEN	..	SER. Wb (40 t). Cr (6 t). Line crosses 2 minor roads.
135.2	..	Bridge or culvert over stream.	Line crosses minor road.
137.1	WELCHINGEN-NEULACHEN	..	SER. Wb (35 t).

Km.	Stations	Engineering works	Details and facilities
141.8	MÜHLMÄULEN (b. ENGEN)	..	Line crosses 3 roads. SR. Wb (25 t).
142.6	..	..	Line crosses road at station. Line crosses 2 minor roads. Line curves S. Line crosses main road before station.
143.4	HÖHENKREUZEN	..	SR. Wb (40 t). Cr (6 t).
143.4	..	..	Line crosses main road to Singen. Line crosses 2 small roads.
148.0	..	..	J (trailing) right, with ST s.o. DE line from Beuren-Büdingen (11.1 km.).
*148.5	..	Bridge over R. Aach.	J (trailing) right, with DT s.o. line from Basel (Route 119).
*148.6	..	..	Line curves E and runs ENE into Singen station. Line crosses road.
*149.1	SINGEN (HOHENTWIEL)	..	SER. Wb (35 t). Cr (6 t). ES. W.
149.7	..	..	Line crosses road. J (facing) right, with ST s.o. line to Steir. (Switzerland).
150.0	..	..	J (facing) right, with sidings. Line crosses several roads.
155.8	BÖHMINGEN- RICKELSHAUSEN	..	Restricted goods facilities.
		Bridge or culvert over stream (Mühl).	By station.
157.0	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
158.0	..	Ditto	
158.2	..	Road overbridge.	Carrying main road from Radolfzell to Horn.
*159.3	RADOLFZELL	..	SER. Wb (40 t). Cr (10 t). ES. W.
			Line runs by the Gnaden See to Konstanz.
*160.2	..		Line crosses several roads after station and curves NE. J (facing) left, with s.o. line to Friedrichshafen, Aulendorf and Ulm (Route 117). (This line is DT from Radolfzell to 8.0 km., ST from there to Friedrichshafen and thence DT to Ulm.)
160.4	..	Bridge or culvert over stream.	
161.0	..	Bridge or culvert over stream.	
			Line curves SE.
162.4	MARKELFINGEN	..	SR. Wb (25 t).
167.8	..	..	Line crosses minor road.
168.1	ALLENSBACH	..	SR. Wb (40 t). Cr (4 t). Passenger station. Line crosses minor road. Line crosses road by station.
173.4	REICHENAU (BADEN)	..	SER. Wb (35 t). Cr (4 t).
174.1	..	Bridge or culvert over stream.	Line crosses minor road.
			Line crosses 3 minor roads.

Km.	Stations	Engineering works	Details and facilities
177.3	KONSTANZ- PETRSHAUSEN	..	SER. Wb (35 t). Cr (4 t). Line curves S and crosses 2 roads.
178.4 179.4	KONSTANZ	Bridge over R. Rhein.	SER. Wb (35 t). Cr (7.5 t). ES. Rps. Line continues across frontier into Switzerland.

ROUTE 112A

HAUSACH-EUTINGEN (MURGTALBAHN)

General Description

This line, which is S.O. and ST, connects the Offenburger-Konstanz line (Route 112) at Hausach with the Immendingen-Stuttgart line (Route 114) at Hochdorf.

The line runs through the Black Forest as far as Freudenstadt following the valley of the R. Kinzig to Lonsburg-Rodt—there are a number of bridges over this river.

There are a number of short tunnels on the line and between Lonsburg-Rodt and Eutingen some viaducts over valleys.

The line is heavily graded climbing from Hausach to Freudenstadt to 736 m. (2,418 ft.) above sea level, with gradients of 50 per mille (1/20), restricting the 0-10-0 T locomotives to hauling only 3 or 4 four-wheeled carriages. From Freudenstadt gradients tend to fall for the rest of the journey.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 69 km. (42½ miles).
3. TRACK: Single.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
Hausach-Freudenstadt, 16 metric tons.
Freudenstadt-Hochdorf, 17 metric tons.
Hochdorf-Eutingen, 20 metric tons.

5. MAXIMUM GRADIENT: 50 per mille (1 in 20).
6. MINIMUM RADIUS OF CURVES: 185 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS:
10.4 km. (6½ miles).
Alpirsbach 22.9 km.—Lonsburg-Rodt 33.3 km.
9. ENGINE SHEDS:
Hausach. Freudenstadt.
10. MARSHALLING YARDS: None.
11. WATERING FACILITIES: As in 9 above. No other details.
12. VULNERABLE POINTS: Marked with asterisk in text.
(a) Locomotive facilities at Hausach and Freudenstadt.
(b) Junctions at Hausach, Freudenstadt and Eutingen.
(c) Bridges at 0.8, 10.7, 16.5, 16.9, 17.9, 18.9, 19.4, 20.2 and 24.3 km.
(d) Tunnels at 17.0, 29.6 and 38.3 km.
Viaducts at 36.5, 41.3, 42.6 and 43.3 km.
13. CAPACITY:
Trains per day Net train load tons
each way military stores
With special 0-10-0 locos. 8-10 80

Distance from Hausach

Km.	Stations	Engineering works	Details and facilities
0	HAUSACH	..	SER. Wb (35 t). Cr. (4 t). ES. Tbl. W. This line runs through the Black Forest as far as Freudenstadt.
..	..	..	J (facing) right with line to Konstanz (Route 112). Line crosses 2 roads.
0.8	..	Bridge over R. Gutach.	Line follows the valley of the R. Kinzig to Lonsburg-Rodt and has many curves. Line curves SE. Line curves N.
2.5	..	..	..
3.0	KIRNBACH	..	SER. Wb (35 t). Line curves NE and then N.
3.4	..	..	..
4.3	WOLFACH	..	SER. Wb (35 t). Cr. (4 t). Line curves SE, then E. Line curves SE. Line curves SE. Line curves SE.
5.0	..	..	..
5.3	..	..	..
5.4	..	..	..

Km.	Stations	Engineering works	Details and facilities
91	HALBMATL	..	SER. Wb (40 t). Line crosses main road after station.
*107 108	..	Bridge over R. Kinzig. Short tunnel.	Line crosses road.
112 139	ST. ROMAN	Bridge or culvert over stream.	Passenger station.
142	SCHILTACH	..	E. of station J (facing) right with DE line to Schramberg (8.8 km). Line crosses minor road.
153	..	Ditto	Line curves NE and runs in this direction to Schenkenszell.
*165 170	..	Bridge over R. Kinzig. Ditto Short tunnel.	Line crosses main road to Freudenstadt.
179	SCHENKENZELL	Bridge over small road and over R. Kinzig.	SER. Wb (32 t). After station.
*189	..	Bridge over R. Kinzig, also over main road to Freudenstadt.	Line crosses minor road.
*194 200	..	Bridge over R. Kinzig. Bridge or culvert over stream.	Line crosses minor road.
*202 210	..	Bridge over R. Kinzig. Bridge or culvert over Stream (Roten).	
216 222	..	Ditto Ditto Ditto	
229	ALPERSBACH	..	SER. Wb (32 t). Cr. (25 t). Line crosses minor road.
234	..	Bridge or culvert over stream.	Line crosses minor road.
241 *243 244	..	Short tunnel. Bridge over R. Kinzig.	Line crosses main road to Freudenstadt.
269	..	Bridge or culvert over stream.	Line crosses minor road twice.
286 293 295 *296 308 310	..	Ditto Ditto Ditto Tunnel. Bridge or culvert over stream.	Line crosses minor road. Line crosses minor road. c. 300 m. long. Line crosses main road.
*323	..	Tunnel.	c. 400 m. long.
333 335	LEGNERS-RODT	Bridge or culvert over stream.	SER. Wb (32 t). Cr. (24 t).
349 349 350 350	..	Road overbridge. Bridge over stream. Bridge over main road.	
*350	..	Viaduct.	Line crosses main road. c. 200 m. long over 2 roads and stream. Tunnel between. Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
37.6	..	Road overbridge.	Carrying main road.
37.8	..	Bridge or culvert over stream.	
38.5	..	Short tunnel.	Line curves and runs NE, crossing minor road into Freudenstadt station.
*39.1	FREUDENSTADT Hbf	..	SER. Wb (32 t). ES. Tbl. W.
39.6	..	Road overbridge.	Carrying main road to Altensteig.
*39.8	..	..	J (facing) left with ST s.o. line to Rastatt (52.6 km.) on the Kehl-Scuttgart line (Route 75). Line crosses minor road. 212 m. = 3 x 45.8 + 2 x 37.4 m. 43 m. high. Line curves E.
*41.3	..	Viaduct over Lauterthal.	
42.2	GRÜNTAL	..	Passenger station. Line crosses road.
*42.6	..	Viaduct over valley, stream (Stocker) and 2 roads.	Line curves ESE. c. 400 m. long.
*43.3	..	Viaduct over valley, R. Glatt and main road.	Line crosses minor road.
44.4	..	Bridge or culvert over stream.	Line crosses minor road.
44.8	DORNSTETTEN	..	SER. Wb (32 t). Cr. (2 t).
45.1	..	Road overbridge.	Line curves SE. Line crosses minor road.
47.8	..	Road overbridge.	Carrying minor road.
48.2	..	Bridge or culvert over stream.	
48.4	..	Road overbridge.	Line runs on embankment for short distance.
49.1	SCHOPFLOCH (B. FREUDENSTADT)	..	SER. Wb (25 t). Cr. (2 t).
51.7	..	..	Line crosses 2 small roads. Line curves E. Line crosses 2 small roads.
52.7	BITTELBRONN	..	Restricted goods facilities. Line crosses minor road.
53.7	..	..	Line curves NE. Line crosses several small roads.
56.6	ALTHHEIM-REXINGEN	Road overbridge.	SER. Wb (32 t). Cr. (2 t). After station. Line crosses 2 roads. Line runs on embankment for c. 2 km.
58.5	..	..	Line crosses road.
59.8	..	..	Line crosses minor road.
60.2	..	Short tunnel.	Line curves ESE. Line crosses minor road.
60.6	..	..	Line curves NE.
61.2	..	..	Line curves E then runs NE to Hochdorf station, crossing a road.
61.9	..	..	The line is DT through station until junction below.
64.3	HOCHDORF (B. HORB)	..	SER. Wb (32 t). Cr. (3 t). Just after station. J (trailing) left with ST s.o. line from Pöschheim.
..	..	Bridge over road.	After station. Line crosses several roads and runs on embankment.
67.3	..	Bridge over main road	

Km.	Stations	Engineering works	Details and facilities
0(13.1) 0(13.4)	..	..	J (triangular) with Immenhingen-Eutingen-Stuttgart line (Route 114).
69.0	EUTINGEN ..	..	SER. Wh. (32 t). Cr. (2 t).

ROUTE 113

BASEL DRB-WALDSHUT-OBERLAUCHRINGEN-SINGEN

General Description

Together with Routes 75, 111, 112, this line provides the main line service, between Karlsruhe and Konstanz, via Basel.

The line follows the right bank of the Rhine to Waldshut, J for a ST line to Turgi and Zürich. At Waldshut the line leaves the Rhine, and after crossing the valley of the R. Schlucht follows the Wutach to Oberlauchringen, J for the ST line to Hirschingen (Route 119a). At Oberlauchringen, the line crosses the Wutach and enters the valley of the R. Klinger, proceeding on a rising gradient over the Swiss frontier at Ertigen (75.2 km.) to rejoin the Rhine at Schaffhausen, J for a ST electrified line to Ertigen and Zürich. The line then crosses the Fulach and follows this river northwards to its source, and thence winds its way through various valleys to Singen, J with the Black Forest Railway from Offenburg (Route 112), the German-Swiss frontier being crossed again at Bietingen (104.2 km.).

In spite of the alignment following rivers and valleys, gradients are fairly high (1 in 62), but not so difficult as those on the Black Forest line, the alternative main line to Konstanz from the Karlsruhe direction.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 113.4 km. (70½ miles).
3. TRACK:
Basel DRB-2.2 km., double.
2.2 km.-Beringen (Reichsb.) (84.9 km.), single.
Beringen (Reichsb.)-Singen (28.5 km.), double.

4. MAXIMUM PERMISSIBLE AXLE LOAD:

Basel-Säckingen, 20 metric tons.
Säckingen-Oberlauchringen, 16 metric tons.
Oberlauchringen-Schaffhausen, 18 metric tons.
Schaffhausen-Singen, 20 metric tons.

5. MAXIMUM GRADIENT: 16 per mille (1 in 62).

6. MINIMUM RADIUS OF CURVES: 300 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

6.3 km. (4 miles).
Neunkirch 80.8 km.-Beringen Reichsb. 87 km.

9. KNOWN SIDES:

Basel-Badischer. Singen. Waldshut.

10. MARSHALLING FACILITIES:

Basel (Weil).
Basel (Muttens) (Switzerland).

11. WATER FACILITIES: No details available.

12. VULNERABLE POINTS: Marked with asterisk in text.

- (a) Marshalling and locomotive facilities given in 9 and 10 above.
- (b) Repair shops at Basel.
- (c) Junctions at Basel, Säckingen 28.6 km., Oberlauchringen-Singen 112.9 km.
- (d) Bridges over R. Wehra (26.1 km.), R. Murg (37.5 km.), R. Alb (47.0 km.), R. Schlucht (59.3 km.), R. Wutach (62.4 and 65.2 km.), R. Fulach (93.7 and 96.5 km.) and R. Ach (112.8 km.).

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
(Throughout capacity)	12-16	250

Distance from Basel

Km.	Stations	Engineering works	Details and facilities
0	BASEL DRB.	..	Frontier station. Junction for lines from Switzerland and France. Passenger station. Restricted goods facilities. SER. Wh. (40 t). Cr. (20 t). ES. (Basel-Badischer). MV (Weil). MV (Muttens) (Switzerland), capacity 2,400 wagons per 24 hours. For details of facilities at Basel, see Route 112, and for location diagram, Plate 1. S. of station, J. Ertigen, J. Hirschingen, with ST line connected to Basel Sub.

Km.	Stations	Engineering works	Details and facilities
0.5	..	..	J (facing) left, with electrified line to Schopfheim and Säckingen (Route 110).
1.7	..	Railway bridge	Line passes 1997 track running toward's Basel Drb.
2.2	..	..	Line runs SE.
			3 tracks from Basel Drb. converge and line becomes ST.
			Line follows the valley of the R. Rheip.
			Line crosses several small roads.
3.2	GRENZACHERBORN	..	Passenger halt.
			Line runs ESE.
			Line crosses road.
4.2	..	Bridge over track.	Line crosses 2 minor roads.
4.9	GRENZACH	..	SER. Wb (25 t).
			Line crosses several small roads.
7.3	WYLEN	..	SER. Wb (35 t).
			(?) Tramline to factory.
			Line crosses minor road.
8.7	..	..	Line curves ENE.
			Line crosses minor road also main road to Rheinfelden.
			Line crosses minor road.
11.1	HERTEN (BADEN)	..	Restricted goods facilities.
			Line crosses 2 minor roads.
14.5	RHEINFELDEN (BADEN)	..	SER. Wb (40 t). Cr (4 t).
			Line curves NE.
			Line crosses roads in town.
18.1	BRUGGEN	..	Restricted goods facilities.
19.0	..	..	Line curves E.
		Bridge or culvert over stream.	Shortly before station.
22.9	SCHWÜRSTADT	..	Restricted goods facilities.
			Line crosses minor road.
24.5	..	..	Line curves SE.
26.1	..	Bridge over R. Wehra.	Line crosses minor road before station.
26.3	BRENNET (RHEINTAL)	..	SER. Wb (25 t). Cr (4 t).
			Line curves SSE.
			Line crosses minor road after station.
28.6	..	..	J (trailing) left, with ST electrified
28.8	..	..	Basel-Singen line (Route 110).
			Line crosses main road to Säckingen.
30.5	..	..	Line curves NE.
			Line crosses roads in town.
31.7	SÄCKINGEN	..	SER. Wb (35 t). Cr (4 t).
			Line crosses minor road.
			Line crosses main road to Laufelingen.
			Line curves E.
			Line crosses minor road.
35.7	..	Bridge or culvert over stream.	
37.2	MURO (BADEN)	..	SER. SR. Wb 35 t. Cr 4 t.
			Bridge crosses minor road after station.
37.5	..	Bridge over R. Murg.	
39.5	LAUSCHEN (BADEN)	..	Passenger halt.
			Line crosses minor road.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
41.8	LAUFENBURG (Balen) Ovt	..	SER. Wb (25 t). Cr (4 t). Line runs NE for some distance.
43.4	..	Bridge or culvert over stream.	Line crosses minor road.
44.2	..	Ditto	
45.0	ALBERT-AUENSTEIN	..	Passenger station. Line crosses 2 minor roads. Carrying minor road.
46.3	..	Road overbridge.	
47.0	..	Bridge over R. Alb.	Line crosses minor road.
47.8	ALBARDER	..	SER. Wb (25 t). Cr (6 t). Line crosses 2 minor roads.
48.3	..	Bridge or culvert over stream.	
48.4	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
50.5	DOGERN	Bridge or culvert over stream (Schulte). Ditto (Lieden)	SER. Wb (25 t). Immediately after station. Line crosses 2 minor roads.
52.2	..	Ditto (Selten)	Line crosses minor roads.
54.4	..		Line curves SE and crosses several minor roads.
55.0	WALDENUT	..	SER. Wb (40 t). Cr (20 t). ES. J (facing) right, after station, with ST s.o. line to Turgi (Switzerland) (17.0 km.). Lines run parallel for c. 1 km.
56.7	WALDENUT-FAHRBAUS	..	Passenger halt. Line curves sharply NE and leaves Rhein valley.
58.8	..	Road overbridge.	
59.3	..	Bridge over R. Schlucht.	
59.8	..	Road overbridge.	
60.4	TIERGREN (OBERARHEIN)	Bridge or culvert over stream (Thal).	SER. Wb (35 t). Cr (4 t).
61.5	..	..	Line curves ESE. Line crosses 2 roads.
62.4	..	Bridge over R. Wutach.	
64.4	OBERLAUCHRINGEN	..	SER. Wb (35 t). Line crosses road. J (facing) left with ST s.o. line to Hintschingen (61.3 km.). Max. axle load 14 t, on the Offenburger-Konstanz line (Route 112).
64.8	..	..
65.2	..	Bridge over R. Wutach.	Line crosses 2 minor roads. Line curves NE. Line curves NE.
66.8	..	Bridge or culvert over stream (Klingen).	
67.6	..	..	Line crosses main road to Griesen twice.
68.9	..	..
70.4	GRÜNGEN	..	SER. Wb (40 t). Cr (4 t). Line crosses 4 small roads. Line crosses 2 small roads.
71.8	..	Ditto	
74.1	LEINEN (GRENZ)	..	SER. Wb (40 t). Cr (6 t). Line crosses minor road at station. Line crosses frontier into Switzerland.
74.2	..	..

Km.	Stations	Engineering works	Details and facilities
75.4	..	Bridge or culvert over stream.	Line crosses 4 small roads.
77.6	..	Ditch	Line crosses main road to Schaffhausen.
77.8	..	..	..
78.2	WILCHINGEN-HALLAU (SCHWEIZ)	..	SER. Wb (30 t). Cr (6 t). Line crosses minor road after station.
80.8	NEUNKIRCH (SCHWEIZ)	..	SER. Wb (35 t). Cr (4 t). Line curves E, then ESE. Line crosses minor road. Line crosses minor road.
81.4	..	Bridge or culvert over stream.	..
81.9	..	..	Line crosses main road to Schaffhausen.
82.3	..	..	Line curves ENE. Line crosses several minor roads.
87.1	BERNOM REICHER (SCHWEIZ)	..	SER. Wb (35 t). Cr (8 t). Double track section begins. Line crosses main road.
89.0	..	..	Line curves SE.
89.3	..	..	Line crosses main road before station.
90.9	NEUNHAUSEN REICHER (SCHWEIZ)	..	SR. Wb (35 t). Cr (6 t). Line curves sharply, crosses road and runs N.
93.4	..	..	Line curves E. J (trailing) right at station with electrified line to Eglisau and Zürich.
93.7	SCHAFFHAUSEN	Bridge over R. Fulach.	SER. Wb (30 t). Cr (10 t). Line curves NNE in town. Line crosses roads in town.
94.8	..	..	J (facing) right, with line on S. bank of the Rhein, through Switzerland to Konstanz. Line crosses 2 roads.
96.5	..	Bridge over R. Fulach. Road over bridge.	Just before station.
98.0	HERBLINGEN	..	Passenger station.
101.0	..	..	Line curves E.
102.3	THAYNGEN	..	SER. Wb (35 t). Cr (6 t). Line crosses minor road after station.
103.0	..	Bridge or culvert over stream.	..
103.3	..	Road overbridge.	..
104.2	..	..	Line crosses frontier back into Germany.
104.9	BIETINGEN (AM KONSTANZ)	Road overbridge. Road overbridge.	Restricted goods facilities. After station. Line crosses several small roads. Before station.
107.3	GOTTMADINGEN	..	SER. Wb (40 t). Cr (8 t). Line crosses road.
108.5	..	Bridge or culvert over stream (Naf).	..
111.2	..	Road overbridge.	Line runs NE to Singen. Line crosses 2 small roads.
111.3	..	Bridge over R. Ach.	Line crosses 2 minor roads.
111.4	..	..	Line crosses 2 minor roads.

Km.	Stations	Engineering works	Details and facilities
113.4	SINGEN (HÖRMENTWIEL)	..	SFR. Wb (35 t). Cr (6 t). ES. 17A, 15. Line continues DT to Radolfzell and Kempten as Route 112, and from Radolfzell to Ulm as Route 117.
123.7	RADOLFFZELL	Route 112.	
113.4	KEMPTEN	Route 112.	
276.0	ULM	Routes 112 and 117.	

ROUTE 113A OBERLAUCHRINGEN-HINTSCHINGEN

General Description

Connecting Routes 112 and 112, this ST line, in spite of its heavy gradients, sharp curves and low permissible axle load, is of great importance in providing the only means for through service for military movements between Basel and Singen without crossing the Swiss frontier as Route 112 does.

The line follows the valley of the R. Wutach to Wiesen on a rising gradient, and thence follows its tributary the R. Mühl, necessitating, in order to minimise the heavy gradients which would otherwise be incurred, a complete spiral and a helical tunnel, followed by 4 more spiral turns in crossing the mountainous region to the Aitach valley. Altogether 6 tunnels are involved of a total length of 4,560.5 m., and a detour of 25.6 km. (15.9 miles) compared with the distance of 10.2 km. (6.3 miles) as the crow flies between Wiesen and Blumberg.

Bridges are frequent throughout, the most important being over the Danube at 60.9 km.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 61.7 km. (38½ miles).

3. TRACK: Single.

4. MAXIMUM PERMISSIBLE AXLE LOAD: 14 metric tons.

5. MAXIMUM GRADIENT: 16 per mille (1 in 62).

6. MINIMUM RADIUS OF CURVES: 300 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

9.9 km. (6½ miles).

Lausheim-Blumberg 23.6 km.-Fützen 33.5 km.

9. ENGINE SIZES: No details available.

10. MARSHALLING FACILITIES: No details available.

11. WATERING FACILITIES: No details available.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Junctions at Oberlauchringen (0.4 km.),
Hintschingen (61.2 km.).

(b) Tunnels at 24.3, 28.4, 37.6 and 44.3 km.

(c) Bridge over R. Donau (60.9 km.).

13. CAPACITY:

Trains per day
each way
12-16

Net train load tons
military stores
250

Distance from Oberlauchringen

Km.	Stations	Engineering works	Details and facilities
334.4	MANNHEIM	Routes 113, 111, 75, 67.	
261.8	KARLSRUHE	Routes 113, 111, 75.	
64.4	BASEL	Route 113.	
0	OBERLAUCHRINGEN	..	SFR. Wb (35 t). Line crosses road after station.
0.4	..	..	J. (facing) right, with a.o. Basel-Singen line (Route 113).
1.0	..	..	Line runs SSE following the valley of the R. Wutach.
3.2	HÖRHEIM	..	SFR (only 7 m. long). Wb (25 t). Crossing minor road.
3.7	..	Road overbridge.	
3.1	WUTACHINGEN	..	Passenger halt. Line crosses main road (a.o.).
3.4	CHERDINGEN	..	SFR. Wb (25 t). Line crosses main road (a.o.).

Km.	Stations	Engineering works	Details and facilities
9.7 11.0	UNTERBOGNER ..	Bridge or culvert over stream.	SER. Wb (25 t).
13.8	ESSENINGEN ..	..	SER. Wb (25 t).
17.4 18.3 18.7 19.7	STÜHLINGEN .. .. ..	.. Ditto Ditto	SER. Wb (25 t). Cr (4 t). Line crosses main road.
20.4 22.4	WEIZEN ..	.. ..	SER. Wb (25 t). Cr (4 t). Line crosses main road to Fützen.
23.6	LAUSCHEN-BLUMBERG ..	..	SER. Wb (25 t). Line runs NNW.
24.1	..	Bridge or culvert over stream (Weller).	
24.3	..	Tunnel.	c. 1,400 m. long. The line describes a complete spiral and, while in tunnel, curves very sharply, curving first E and then SSE.
		Bridge over R. Wutach.	Immediately after tunnel. Line curves S then SSE.
25.7	..	..	Line curves E.
27.4 28.4	.. ..	Tunnel.	Line curves ENE. Line describes a complete spiral most of the line in the tunnel.
32.2	..	Bridge or culvert over stream (Mühl).	Line crosses main road to Fützen.
32.4	..	..	..
33.5	FÜTZEN ..	..	SER. Wb (25 t). Between Fützen and Zollhaus-Blumberg the line describes a double spiral.
34.9	..	Bridge or culvert over stream (Mühl).	
35.0	..	..	Line crosses main road. Line curves sharply left and runs SSW.
35.9 36.4	.. ..	Ditto ..	Line curves W and then starts on the first spiral turn, curving right.
37.6 37.8 40.2	.. .. ..	Tunnel. Road overbridge.	Line crosses small road. c. 400 m. long. Crossing main road.
40.9	EFFENHOFEN ..	..	Restricted goods facilities. Line leaves valley of R. Wutach and runs in valley of R. Aitach until that river runs into the R. Donau near Hetschingen.
41.3	..	Bridge or culvert over stream.	Line crosses road. Line runs S for short distance, then starts to curve left starting the second spiral turn.
42.6	..	Ditto	
42.7	..	Road overbridge.	Line crosses road. Crossing main road.
44.2 44.3 45.1	.. .. ..	Tunnel.	c. 200 m. long. Line is now running N. Line curves E and runs in that direction to station. Line crosses main road just before station.

SS. WUTACH CR. ST.
L. AITACH CR. ST.
L. DONAU CR. ST.

Km.	Stations	Engineering works	Details and facilities
30.4	RIEDSCHINGEN	Bridge or culvert over stream (Kompromiss).	SR. Wb (25 t). After station.
33.5	..	Bridge or culvert over stream (Breitental).	
34.1	LEIPFERTINGEN	Bridge or culvert over stream.	SR. Wb (25 t). Line crosses road.
34.6	..	Bridge or culvert over stream.	
36.2	..	Bridge or culvert over stream.	
36.6	AULFINGEN	..	SR. Wb (25 t).
36.9	..	Ditto	
37.9	..	Ditto	Line crosses main road just before station.
39.7	KIRCHEN-HAUSEN	..	SR. Wb (25 t). Line crosses road.
40.9	..	Bridge over R. Donau.	
41.2	..	..	J (trailing) left, with s.o. Offen- burg-Konstanz line (Route 112). Passenger station.
61.7	HINTSCHINGEN	..	..
64.9	IMMENDINGEN	Route 112.	
95.0	SINGEN	Route 112.	
125.3	KONSTANZ	Route 112.	

ROUTE 114

IMMENDINGEN-TUTTLINGEN-ROTTWEIL-EUTINGEN-HERRENBURG-STUTTGART

General Description

With connections at Immendingen with the Black Forest Railway, Offenburg-Konstanz (Route 112), this line provides a main line service from Zürich and Konstanz to Stuttgart, where it connects with Route 75 for Heilbronn, Würzburg and Berlin.

From Immendingen the line proceeds along the left bank of the Danube for 7.6 km. when it crosses the river to follow the right bank of the river, converging at 8.6 km. with the fast line connection from Konstanz via Hattlingen.

At Tuttlingen, after a facing connection to the ST line to Ulm (Route 115), the line becomes ST to Sulz, and crosses the Danube to proceed with a rising gradient along the valley of a tributary to its source near Spaichingen. It then descends the valley of a tributary of the Neckar to its confluence with the Neckar at Rottweil, J for 2 local branch lines connecting with Villingen on Route 112, and with Balingen on the ST line Sigmaringen-Tübingen.

From Rottweil the line follows the Neckar with many sharp curves and bridges on a falling gradient to Horb, J for the ST line to Tübingen, Plochingen and Stuttgart (Route 115), and soon after Horb enters a tunnel of 300 m. and takes N and SE to Eutingen, J for the connecting line down Heuchel (Route 112), and the SE alternative line to Stuttgart via C.

From Eutingen the line crosses the Neckar and enters the Heuchel tunnel, where it is joined by a ST line from Tübingen.

The line is a main line service with a maximum

The track is double, apart from the section between Rottweil and Sulz, for which, however, doubling was under consideration, and may now have been carried out.

General Details

- GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
- LENGTH: 148.4 km. (92½ miles).
- TRACK:
 - Immendingen-Rottweil (37.6 km.), double.
 - Rottweil-Sulz (29.2 km.), single(?).
 - Sulz-Stuttgart (81.6 km.), double.
- MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
- MAXIMUM GRADIENT: 20 per mille (1 in 50).
- MINIMUM RADIUS OF CURVES: 300 m.
- TRACTION: Steam.
- MAXIMUM DISTANCE BETWEEN STATIONS:
 - 10.0 km. (6½ miles).
 - Horb 81.0 km.-Eutingen (Württ.) 91.0 km.
- ENGINE SHEDS: Rottweil. Stuttgart.
- MARSHALLING FACILITIES:
 - Horb (SY).
 - Stuttgart (Kornwestheim).
 - Stuttgart-Untertürkheim.
- WATERING FACILITIES: No details available.
- VEHICLE LOCUS: Marked with asterisk in text.
 - (a) Repair workshops at Stuttgart, also loco shed and shunting facilities.

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(b) Junctions at Immendingen (0.5 km.), Tuttlingen (9.6, 10.5 km.), Hbf (81.0 km.), Rottweil, E. tingen (92.1, 92.5 km.), and Stuttgart.

(c) Tunnels at 84.7, 134.6, 135.6, 137.2 and 145.3 km.

(d) Bridges over the R. Donau 7.6 and 10.6 km.

Bridges over the R. Neckar 36.9, 39.5, 42.0, 62.8 and 81.4 km.
Viaducts at 104.3, 115.3 and 133.8 km.

13. CAPACITY

Assuming DT throughout

Trains per day each way	Net train load tons military stores
48	200

Distances from Immendingen

Km.	Stations	Engineering works	Details and facilities
0	IMMENDINGEN	..	SER. Wb (35 t). Line follows R. Donau to Tuttlingen.
0.4	..	Bridge or culvert over stream (Weissen).	
0.5	..	..	J (facing) right, with connection to Konstanz line (Route 112). Line crosses minor road. Line curves sharply SE after crossing river. Line curves sharply left and runs NNW.
2.6	..	..	Line curves right and runs NE to Möhringen station, crossing minor road before station.
5.2	..	..
6.6	MÖHRINGEN (BADEN)	..	SER. Wb (32 t). Cr (0.9 t). Line crosses road.
7.6	..	Bridge over R. Donau.	
7.8	..	Bridge or culvert over stream.	
8.6	..	..	J (trailing) right, with connection from Konstanz line.
9.9	TUTTLINGEN	..	SER. Wb (40 t). Cr (8.6 t). J (facing) right, with a.o. line to Sigmaringen and Ulm (Route 116). (This line is ST except for DT section from Ulm-Söflingen to Ulm Hbf.) Immediately after junction above. Line curves NW.
10.5	..	..
11.0	..	Bridge over R. Donau.	
11.0	..	Bridge over arm of R. Donau.	
12.7	..	Bridge or culvert over stream.	Line crosses minor road.
13.1	WÜRMINGEN OST	..	Passenger station. Line crosses minor road after station. Carrying minor road.
13.7	..	Road overbridge.	
14.0	..	Bridge or culvert over stream.	
14.2	WÜRMINGEN	..	SER. Wb (32 t). Cr (9.5 t). Line crosses main road to Rottweil. Line crosses minor road.
14.8	..	..
15.7	WEILHEIM (B. TUTTLINGEN)	..	Passenger halt. Carrying minor road.
17.1	..	Road overbridge.	
17.5	REIHEIM (WÜRTT)	..	SER. Wb (41 t). Carrying main road to Rottweil. Line crosses minor road.
20.1	..	Road overbridge.	
21.0	REIHEIM	..	Passenger halt. Line crosses minor road.
22.2	..	..	J (facing) right, with ST Co. DE line from Reichenbach (Hbf) (17.5 km).

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
22.6	SPACHINGEN	..	SER. Wb (32 t). Cr (1.6 t). Line crosses minor road.
23.3	..	Bridge or culvert over stream.	Line curves N.
23.7	..	Ditto	Line crosses 3 minor roads.
24.6	HOFEN (S. SPACHINGEN)	..	Passenger station.
24.9	..	Bridge or culvert over stream.	Line curves NW.
25.2	..	Ditto	
25.6	..	Ditto	
26.3	..	Ditto	
26.8	ALDENHORN (S. SPACHINGEN)	..	ER. Wb (32 t). Cr (2 t).
27.1	..	Ditto	Line crosses road. Line crosses road.
28.8	..	Bridge or culvert over stream.	Ditto
29.2	NEUREN	..	Passenger station.
29.4	..	Ditto	Line crosses road.
29.8	..	Bridge or culvert over stream.	Line crosses road before station.
30.8	NEUTRA (S. ROTTWEIL)	..	SER (only 7 m. long). Wb (32 t). Line crosses main road to Rottweil.
31.2	..	Ditto	
31.6	..	Ditto	
32.2	..	..	Line crosses 2 minor roads. Line converges with line from Villingen and they run together until
33.7	..	..	J (trailing) left, with ST s.o. line from Villingen (23.7 km.) on the s.o. Offenburg-Konstanz line (Route 112).
34.4	..	..	Line crosses main road. Line passes over or under ST s.o. line from Balingen.
34.9	..	Fly-over.	Line crosses minor road. J (trailing) left, with ST s.o. line from Balingen.
35.8	..	..	SER. Wb (40 t). Cr (2 t). Line crosses minor road and curves E.
35.8	ROTTWEIL ALTSTADT	..	
36.9	..	Bridge over R. Neckar.	
37.6	ROTTWEIL	..	SER. Wb (32 t). Cr (2 t). ES. End of DT section. ST section begins. Line runs in the valley of the R. Neckar to Herb. There are many curves in the line as it follows closely the course of the river. Line curves NNW. Line crosses several minor roads.
37.8	..	..
39.4	..	Road overbridge.	
39.5	..	Bridge over R. Neckar.	
40.0	..	Ditto	Line crosses minor road.
41.7	..	Road overbridge.	
42.5	..	Bridge over R. Neckar.	
43.3	..	Ditto	Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
44.1 44.6	TALHAUSEN ..	..	SER. Wb (32 t). Cr (1.2 t). Line curves NW. Line crosses minor road before station.
45.8	TALHAUSEN- HERRNZEINERN	..	Passenger halt.
		Bridge or culvert over stream.	After station.
47.9	..	Ditto	Line curves NE, then NNW.
			Line crosses a minor road.
49.5	LEPPENDORF	..	SER. Wb (32 t). Cr (1.2 t). Line crosses main road to Oberndorf twice.
51.2	..	Ditto	Line crosses main road twice.
52.2	ALTOBERNDORF	..	Passenger station.
52.6	..	Road overbridge.	
53.2	..	Bridge or culvert over stream.	
53.3	..	Road overbridge.	
55.5	OSBERNDORF (NECKAR)	..	SER. Wb (32 t). Cr (15 t).
57.8	AMTAL	..	Restricted goods facilities.
58.0	..	Bridge or culvert over stream.	Line crosses minor road.
58.3	..	..	Line curves NE.
59.9	..	..	Line curves N.
60.9	..	..	Line curves NE.
65.7	..	Road overbridge.	Line crosses main road. Before station.
66.8	SULE (NECKAR)	..	SER. Wb (32 t). Cr (2.3 t). End of ST section. Beginning of DT.
		Road overbridge.	Before station, carrying main road to Horb.
			Line curves NW and crosses minor road.
69.8	..	Bridge over R. Neckar.	
70.6	..	Road overbridge.	
70.9	FISCHINGEN	..	Passenger station.
73.9	..	Road overbridge.	
74.0	NECKARHAUSEN (S. HORB)	..	SER. Wb (32 t). Cr (1.2 t).
		Road overbridge.	Before station.
75.7	DETTINGEN (HOHENZ.)	..	Passenger station.
79.4	..	Bridge or culvert over stream.	
81.0	HORB	..	SER. Wb (32 t). Cr (3 t). ST at station.
	..	..	J (facing) right, with line to Plochingen.
			This line is partly DT and partly ST steam operated as far as Tübingen, and electrified from Tübingen to Plochingen (R. 2/2 11.7).
81.1	..	Road overbridge.	
81.4	..	Viaduct over valley, R. Neckar and road.	.. 200 m. long
		..	
81.9	..	..	..
81.7	..	..	Line curves NNW and crosses R. Neckar.

Km.	Stations	Engineering works	Details and facilities
87.0	..	..	Line curves E.
89.1	..	..	Line crosses several roads. J (facing) left, with connection to Hausach-Eutingen line (Route 1120).
91.0	EUTINGEN	..	SER. Wb (32 t). Cr (2 t).
91.3	..	Road overbridge.	Line curves NNE.
91.7	..	..	J (trailing) left, with ST s.o.
92.1	..	..	Hausach-Eutingen line (Route 1120).
93.4	ERKENZINGEN	..	ER. Wb (32 t). Cr (2 t).
93.7	..	Bridge or culvert over stream.	Line crosses minor road.
97.0	..	Road overbridge.	Line crosses 3 roads.
97.5	BONDORF (B. HERRNBURG)	..	ER. Wb (32 t). Cr (2 t).
99.1	..	Bridge or culvert over stream (Kochenhart).	Line crosses road.
100.6	..	Road overbridge.	Ditto
101.6	..	Ditto	
102.0	NEBRINGEN	..	ER. Wb (40 t). Cr (2 t).
102.3	..	Bridge over minor road or stream.	
103.5	..	..	Line crosses main road to Herren- burg.
*104.3	..	Viaduct over 2 roads and stream.	
104.8	..	Bridge over stream.	Line curves NE.
105.7	..	Ditto	
106.1	..	..	J (trailing) right, with ST s.o. line from Tübingen Hbf. (20.8 km.) on the Horb-Plochingen line (Route 1115).
106.6	HERRNBURG	..	SER. Wb (32 t). Cr (2 t).
106.9	..	Bridge over road.	Line curves N.
107.1	..	Bridge or culvert over stream.	Line crosses road and curves NE.
108.9	..	Bridge over road.	Line crosses minor road.
109.7	..	Bridge or culvert over stream.	
110.0	..	Ditto	Line crosses road.
110.6	NUTRINGEN	..	..
111.0	..	Bridge over road.	Line crosses road.
111.7	..	Bridge or culvert over stream.	
113.1	..	Ditto	
113.2	..	Bridge over road.	
113.5	GÄRRINGEN	..	SER. Wb (40 t). Cr (2 t).
114.1	..	Bridge or culvert over stream.	Line crosses minor road.
115.3	..	Ditto	Ditto
*115.3	..	Viaduct over valley R. Worm and road.	Line runs on embankment.
115.5	..	Road overbridge.	Line crosses minor road.
			Ditto

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Km.	Stations	Engineering works	Details and facilities
117.1	RENNINGEN (near Böblingen)		SER. Wb (32 t). Cr (2 t). Line crosses several minor roads before Böblingen. Line runs on embankment for a short distance.
117.6	..		
117.6	..	Bridge over road.	
121.6	..	Bridge or culvert over stream.	
121.7	..		J (trailing) right, with ST s.o. line from Dettenhausen (16.4 km.) and Schönaich (6.9 km.).
121.8	..	Road overbridge.	J (facing) left, with short DE span.
122.3	BÖBLINGEN		
123.6	..	Bridge over road.	J (facing) left, with ST s.o. line to Renningen (13.9 km.) on the Calw-Stuttgart line.
123.7	..		
123.9	..	Road overbridge.	Line runs through the Böblingen forest to Vaihingen. Line crosses main road. Line crosses minor road.
124.9	..		
126.1	..	Bridge over R. Borstlach.	Line crosses 3 minor roads.
129.7	..	Bridge over stream.	Carrying autobahn.
130.7	..	Road overbridge.	Line curves NNW and runs in that direction to Vaihingen. J (trailing) right, with ST s.o. DE line from Waldenbuch (14.9 km.), and ST s.o. DE line from Neuhausen (Filder) (13.9 km.). Line crosses road.
131.6	VAIHINGEN-ROHR		Passenger station. Line crosses road before station.
132.7	VAIHINGEN (FILDER)		SER. Wb (31 t). Cr (2 t). I for narrow-gauge (1 m.) electrified line to Hohenheim-Plieningen.
		Bridge or culvert over stream (Sindel).	Line crosses road. Line curves N.
133.5	..		
*133.8	..	Viaduct over valley, stream, and road.	Line curves NW.
134.4	..	Bridge or culvert over stream.	
*134.6	..	Short tunnel.	Line curves NE.
135.0	..	Bridge or culvert over stream.	Line curves NNW. Line crosses road.
136.4	..		
*136.6	..	Short tunnel.	Line curves NE.
137.1	..	Bridge over road.	
137.2	WILDPARK		Passenger station. Line curves ESE.
137.5	..		Line curves NE and crosses minor road.
138.0	..		
138.1	STUTTGART HESLACH		Halt. Line crosses minor road.
138.4	..	Road overbridge.	Line curves NW.
*138.7	..	Tunnel.	c. 120 m. long. Just before station.

Km.	Stations	Engineering works	Details and facilities
127.8	STUTTGART WEST	..	Line crosses minor road. Line curves sharply right and runs NE crossing several roads. c. 640 m. long.
*143.3	..	Tunnel.	Line crosses roads in town.
*145.0	..	..	J (facing) left, with connection to lines to Calw and Karlsruhe (Route 75) and Nürnberg.
145.4	..	Railway bridge.	Line curves sharply right.
145.8	..	Ditto	Over sidings to Nord goods station and to Rps.
*146.1	..	..	Over line from Stuttgart Hbf. to Stuttgart Nord.
		Railway bridge.	J (trailing) left, with lines from Calw; and Karlsruhe (Route 75); and Nürnberg.
			Line runs SW into station.
			Over line to main goods station.
*148.4	STUTTGART Hbf.	..	Main station. ES. Tbl (21-25 m.). W. Rps (Loco. and passenger and goods rolling stock). Electric sub-station, also power station for electric supply at Münster. MT: Untertürkheim, capacity 2,200 wagons per 24 hours. Also at Kornwestheim, capacity 4,800 wagons per 24 hours. For details of facilities at Stuttgart, see Amendments to pages 101, 111, and 112 of I.S.T.D./C/317; and for illustrations, Plans 33-33g.
197.7	HEILBRONN	Routes 75 and 77.	
325.0	WÜRZBURG	Routes 75, 77, and 99.	

ROUTE 113

HORB-TÜBINGEN-REUTLINGEN-PLOCHINGEN (STUTTGART)

General Description

Providing a route between Horb and Stuttgart alternative to Route 114, the line runs ST 20, along the Neckar valley to Tübingen, J for the ST line from Sigmaringen.

The line runs DT electrified from Tübingen and at Kirchentellinsfurt (385 km.) deviates from the Neckar, proceeding along the valley of its tributary the Echaz to serve the important town of Reutlingen, J for a cross country branch line to Scheßlingen on the Tuttlingen-Ulm line (Route 116), and from Reutlingen crosses fairly hilly country to rejoin the Neckar at Neckartallingen and to follow the right bank of the river to Plochingen.

At Plochingen, the line crosses the R. Fils and joins the main DT electrified line Ulm-Stuttgart (R 112/120).

The proposed junctions are at H. with the main line from Ulm to Stuttgart (R 112/120) at Tübingen with the ST line from Sigmaringen, and at Reutlingen with the branch line to Scheßlingen. The line is to be built from H. to Tübingen, and from Tübingen to Reutlingen, and from Reutlingen to Plochingen. The line is to be built from H. to Tübingen, and from Tübingen to Reutlingen, and from Reutlingen to Plochingen.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 80.8 km. (50½ miles).
3. TRACK:
 - Horb-Tübingen Hbf (31.7 km.), single.
 - Tübingen Hbf-Plochingen (80.8 km.), double.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
 - Horb-Tübingen, 18 metric tons.
 - Tübingen-Plochingen, 20 metric tons.
5. MAXIMUM GRADIENT: 10 per mille (1 in 90).
6. MINIMUM RADIUS OF CURVE: 145 m.
7. TRACTION:
 - Horb-Tübingen Hbf, steam.
 - Tübingen Hbf-Plochingen, electric.
8. MAXIMUM PASSENGER TRAIN SPEED:
 - Horb-Tübingen, 40 km/h.
 - Tübingen-Plochingen, 40 km/h.

10. MAINTAINING FACILITIES:

Horb. Stuttgart (Route 82).

11. WATERING FACILITIES: As in 9 above. No other details.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Locomotive sheds as in 9 above.

(b) Junctions at Horb, Tübingen (31.7 km.), Reutlingen (46.1 km.) and Plochingen (78.8 km.).

(c) Tunnel (42.6 km.).

(d) Bridges at 7.4, 12.9, 16.6, (Neckar) 17.6, (viaduct over Neckar) 31.9, 36.9, 37.9, 40.2 (viaduct), 42.6, 54.9, 61.7, 75.3 and 79.5 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Horb-Tübingen	12-16	350
Tübingen-Plochingen		
Steam	48	350
Electric	60	500

Distance from Horb

Km.	Stations	Engineering works	Details and facilities
81.0	IMMENDINGEN	Route 114.	
0	HORB	..	SER. Wb (32 t). Cr. (5 t). SY. ? ES. At station J (facing) left with s.o. line to Herrenburg and Stuttgart (Route 114). Line follows south bank of R. Neckar to 16.6 km. Line runs NE.
0.3	..	Road overbridge.	
1.2	Line curves ESE.
1.9	Line curves NE.
2.1	..	Bridge or culvert over stream.	
3.3	MÜHELM (S. HORB)	..	ER. Wb (32 t). Cr. (1.2 t). Line runs ESE, crossing minor road. Line curves NE.
4.1	Line curves NE.
5.1	Line curves SE.
7.2	Line curves ENE.
*7.4	..	Bridge over R. Eyach.	Line crosses road. Line runs to station in a ESE direction.
8.0	EYACH	..	SER. Wb (32 t). Cr (2 t). I for standard gauge ST s.o. light railway to Gammertingen (54.9 km.), there the line branches and goes to Sigmaringen Privatb: 23.1 km. on the Tuttlingen-Ulm line (Route 116). The other branch goes to Kleinengstingen (19.7 km.). c. 500 m. long. Line curves NE. Line crosses minor road.
*11.2	..	Tunnel.	
11.9	Line crosses road.
12.2	..	Bridge or culvert over stream.	
*13.9	..	Bridge over R. Starzel.	
14.1	BERINGEN (S. HORB)	..	SER. Wb (26 t). Line curves ENE.
16.0	Line crosses road.
*16.6	..	Bridge over R. Neckar.	Line follows S bank of Neckar.
17.6	REUTLINGEN	..	SER. Line curves ESE then NE.
*17.9	Line curves NE.
18.1	Line curves NE.
18.2	Line curves NE.
18.3	Line curves NE.
18.4	Line curves NE.
18.5	Line curves NE.
18.6	Line curves NE.
18.7	Line curves NE.
18.8	Line curves NE.
18.9	Line curves NE.
19.0	Line curves NE.
19.1	Line curves NE.
19.2	Line curves NE.
19.3	Line curves NE.
19.4	Line curves NE.
19.5	Line curves NE.
19.6	Line curves NE.
19.7	Line curves NE.
19.8	Line curves NE.
19.9	Line curves NE.
20.0	Line curves NE.
20.1	Line curves NE.
20.2	Line curves NE.
20.3	Line curves NE.
20.4	Line curves NE.
20.5	Line curves NE.
20.6	Line curves NE.
20.7	Line curves NE.
20.8	Line curves NE.
20.9	Line curves NE.
21.0	Line curves NE.
21.1	Line curves NE.
21.2	Line curves NE.
21.3	Line curves NE.
21.4	Line curves NE.
21.5	Line curves NE.
21.6	Line curves NE.
21.7	Line curves NE.
21.8	Line curves NE.
21.9	Line curves NE.
22.0	Line curves NE.
22.1	Line curves NE.
22.2	Line curves NE.
22.3	Line curves NE.
22.4	Line curves NE.
22.5	Line curves NE.
22.6	Line curves NE.
22.7	Line curves NE.
22.8	Line curves NE.
22.9	Line curves NE.
23.0	Line curves NE.
23.1	Line curves NE.
23.2	Line curves NE.
23.3	Line curves NE.
23.4	Line curves NE.
23.5	Line curves NE.
23.6	Line curves NE.
23.7	Line curves NE.
23.8	Line curves NE.
23.9	Line curves NE.
24.0	Line curves NE.
24.1	Line curves NE.
24.2	Line curves NE.
24.3	Line curves NE.
24.4	Line curves NE.
24.5	Line curves NE.
24.6	Line curves NE.
24.7	Line curves NE.
24.8	Line curves NE.
24.9	Line curves NE.
25.0	Line curves NE.
25.1	Line curves NE.
25.2	Line curves NE.
25.3	Line curves NE.
25.4	Line curves NE.
25.5	Line curves NE.
25.6	Line curves NE.
25.7	Line curves NE.
25.8	Line curves NE.
25.9	Line curves NE.
26.0	Line curves NE.
26.1	Line curves NE.
26.2	Line curves NE.
26.3	Line curves NE.
26.4	Line curves NE.
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49.9	Line curves NE.
50.0	Line curves NE.

Km.	Stations	Engineering works	Details and facilities
21.0	ROTTENBURG (NECKAR)		SER. Wb (32 t). Cr (2 t). Main road to Rottenburg.
21.9	..	Bridge over road.	
22.3	..	Culvert over stream (Calgen).	Line crosses minor road.
24.1	KIEBINGEN		Passenger halt.
25.9	..	Bridge over stream (Mühl).	
26.9	KILCHENRO		SER.
28.2	..	Bridge over track.	Line curves NNE. Line crosses main road before halt.
28.9	WEILHEIM (B. TÜBINGEN)	..	Passenger halt.
30.9	..	..	J (trailing) right with short DE spur. Line converges with ST s.o. line from Sigmaringen (c. 87.5 km.) on the s.o. Tuttlingen-Ulm line (Route 116) and they run together to station.
31.3	..	Bridge or culvert over stream.	J (trailing) left with ST s.o. line from Herrenburg (c. 21.3 km.) on the Immendingen-Stuttgart line (Route 114).
31.7	TÜBINGEN Hbf.	..	SER. Wb (32 t). Cr (20 t). ES. ST s.o. section ends at Tübingen Hbf. and the rest of the line is DT electrified. J (trailing) right with ST s.o. line from Insigkofen (82.4 km.) on the Tuttlingen-Ulm line (Route 116).
31.9	..	Bridge over R. Steinbach.	
32.1	..	Road overbridge.	Line curves E.
33.4	..	..	J (trailing) right with short DE spur.
		Bridge or culvert over stream.	Line crosses road before station.
34.8	TÜBINGEN-LUTZAU	..	Restricted goods facilities.
36.7	..	..	Line curves E.
36.9	..	Bridge over R. Blaulach.	Line runs SE to station.
37.8	..	Road overbridge.	
37.9	..	Bridge over R. Ramslach.	
38.3	KIRCHENTELLINFURT	..	SER. Wb (32 t). Cr (5 t). Line runs SE and away from the R. Neckar.
40.2	..	Viaduct over valley stream (Heb) and road.	Line crosses road before station.
40.7	WANNWEIL	..	SER. Wb (23 t).
42.0	..	Bridge or culvert over stream.	Line crosses road to Tübingen.
43.2	..	Ditto Bridge over road.	
43.3	REUTLINGEN-BETZINGEN	..	SER. Wb (32 t). Cr. (1.5 t). For narrow gauge (1 m.) electrified tramway to Eningen (7.3 km.). Line passes under ST s.o. line from Göppingen (c. 16.3 km.). J (trailing) left with above line.
43.6	..	Short tunnel.	
43.9	..	..
44.1	..	Bridge or culvert over stream.	
		Road overbridge.	Line crosses minor road. Carrying minor road. Line crosses road to Eningen. Line crosses NE

Km.	Stations	Engineering works	Details and facilities
47.4	REUTLINGEN-TÜTTLINGEN VORSTADT	..	Passenger station.
*47.6	..	Bridge over R. Echaz.	Line crosses road.
*47.1	REUTLINGEN (Hbf.)	..	SER. Wb (32 t); Cr (20 t). ES. I for narrow gauge line to Alten- berg. J (facing) right with ST s.o. line to Schelklingen (58.3 km.) on the Tübingen - Sigmaringen - Ulm line (Route 116) (from Honnau to Lichtenstein on this line is rack railway c. 2 km.).
48.4	..	Road overbridge.	
48.5	..	Bridge or culvert over stream.	
47.9	..	Road overbridge.	Carrying minor road.
48.8	..	Bridge or culvert over stream.	* Line crosses road just before station.
49.3	REUTLINGEN-SONDELFINGEN	..	
49.7	..	Ditto	Line runs on embankment for short distance.
50.8	..	Ditto	
50.9	..	Road overbridge.	Carrying main road to Metzingen. Line crosses minor road.
51.9	..	Bridge or culvert over stream (Riedrich).	
52.1	Line runs on embankment for short distance.
52.5	..	Road overbridge.	
52.6	..	Bridge or culvert over stream.	Line crosses minor road.
53.2	..	Bridge over stream.	
53.8	..	Ditto	
*54.0	..	Bridge over R. Erma.	Line curves left and runs N into station.
54.1	..	Bridge over road.	S. of station. J (trailing) right with ST s.o. DE line from Urach (10.4 km.). Line crosses minor road at station.
54.6	METZINGEN	..	SER. Wb (32 t). Cr (12 t). Line crosses road.
55.0	..	Road overbridge.	Line crosses minor road.
56.4	..	Bridge or culvert over stream.	
57.2	..	Bridge over road.	
57.5	..	Culvert over stream (Helfers).	Line crosses 2 roads.
58.6	BEMPFLINGEN	..	SER. Wb (32 t). Cr (4.4 t). Line crosses minor road.
*61.7	..	Bridge over R. Autmut.	
62.2	..	Road overbridge.	Line curves right runs ENE.
63.0	..	Short tunnel.	
63.7	NECKARTAILFINGEN	..	SER. only 7 m. long. Wb (30 t). Cr (3 t). Line follows valley of R. Neckar to Plochingen. Line crosses minor road. Line curves NE.
64.7	..	Road over bridge.	
64.9	..	Bridge over stream.	

Km.	Stations	Engineering works	Details and facilities
66.5 66.9	..	Bridge over road.	Line passes under (?) cable line between two factories.
67.5	..	..	J (trailing) right with ST s.o. DE line from Neuffen (8.3 km.). Line crosses several roads.
68.2	NÖRTINGEN	..	SER. Wb (40 t). Cr (6 t). Carrying minor road.
68.7 70.2	..	Road overbridge. Bridge or culvert over stream.	..
71.2	OBERBÖHMINGEN	..	Restricted goods facilities. Line crosses 3 minor roads. Carrying autobahn. Line crosses road.
73.4	..	Road overbridge.	..
74.1	UNTERBÖHMINGEN	..	SER. Wb (26 t). Cr (2 t). North of station. J (trailing) right with ST s.o. DE line from Oberlenningen (17.4 km.) and also DE from Weilheim Teck (16.2 km.). Line crosses road to Kirchheim.
74.4 *75.2 75.9 76.3	..	Bridge over R. Lauter. .. Bridge or culvert over stream.	Line curves NE.
78.2	WERNAU (NECKAR)	..	Line crosses road after station. Line curves left and runs NW to Plochingen.
*79.5 *79.8	..	Bridge over R. Filz.	J (trailing) right with DT electrified line from Ulm (Route 82).
79.9	..	Road overbridge.	..
80.8	PLOCHINGEN	..	SER. Wb (32 t). Cr (5 t). ES. Tbl. W.
110.0	STUTTGART (Hbf.)	(Route 82).	..

ROUTE 116

TUTTLINGEN-SIGMARINGEN-HERBERTINGEN-ULM

General Description

Connecting with Route 114 at Tuttlingen and Route 82 at Ulm, this ST line provides an important cross country service from SW Baden area (Rust, Freiburg and Konstanz) to the main W-E line at Ulm.

The line follows the valley of the Danube from Tuttlingen to Ehingen, whence it proceeds along the valleys of its tributaries, the Schmied, the Ach, and the Blau; gradients are not therefore severe, but from Ehingen to Schelklingen the tendency will be for the gradient to be a rising one, the peak being at Schelklingen where it crosses from the valley of the Schmied to the valley of the Ach.

Several important bridges are encountered particularly from Tuttlingen to Ehingen over the Danube, and one long one at Plochingen (13.0 km.) over the Aach and R. Filz.

There are no tunnels at Tuttlingen and the line is not a rack section. The line is a single track with a maximum speed of 100 km/h.

and at Schelklingen with the ST branch line from Reutlingen, which involves a rack section in crossing the Rauhe Alb.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 135.0 km. (83½ miles).
3. TRACK:
 - Tuttlingen-Ulm-Sölingen, single.
 - Ulm-Sölingen-Ulm Hbf, double.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
 - Tuttlingen-Mengen, 16 metric tons.
 - Mengen-Schelklingen, 20 metric tons.
 - Schelklingen-Ulm-Sölingen, 18 metric tons.
 - Ulm-Sölingen-Ulm Hbf, 20 metric tons.
5. MAXIMUM GRADIENT: 2.5% (1 in 40).
6. MAXIMUM CURVE: 100 m. (328 ft.).
7. TRACKS: 1.
8. MAXIMUM WAGON LENGTH: 12.5 m. (41 ft.).

9. ENGINE SHEDS: Ulm.
 10. MARSHALLING FACILITIES: Ulm.
 11. WATERING FACILITIES: No details.
 12. VULNERABLE POINTS:
 (a) Marshalling and locomotive facilities at Ulm.
 (b) Junctions at Tuttlingen, Inzigkofen (36.3), 46.1 and 51.9 km., Herbertingen, Schelllingen and Ulm.

- (c) Bridges at 0.6, 1.5, 9.7, 13.0, 13.9, 14.0, 16.8, 19.1, 31.2, 31.9, 32.6, 33.7, 35.3, 41.8, 42.6, 47.2, 48.3, 51.6, 70.5, 77.6, 82.4, 112.7, 117.0, 118.0, 119.2 and 134.2 km.
 (d) Tunnel at 15.0 km.

13. CAPACITY:

Trains per day each way Net train load tons military stores
 (Throughput capacity) 12-16 350

Distances from Tuttlingen

Km.	Stations	Engineering works	Details and facilities
0	TUTTLINGEN	..	SER. Wb (40 t). Cr (8.6 t). Line follows the course of the R. Donau and has many sharp curves.
0.6	..	..	J (facing) left, with line to Rottweil and Stuttgart (Route 114). Immediately after junction above.
1.5	..	Bridge over R. Donau. Bridge over arm of R. Donau.	Line crosses several roads.
2.2	TUTTLINGEN-VORSTADT	..	Passenger station. Line crosses road.
4.8	..	Bridge or culvert over stream.	
6.0	NENDINGEN (B. TUTTLINGEN)	..	SER. Wb (32 t). Line crosses minor road.
8.1	STETTEN (DONAU)	..	Passenger station. Line crosses minor road.
9.3	MÜHLHEIM (B. TUTTLINGEN)	..	SER. Wb (32 t). Cr (1.5 t). Line crosses minor road.
9.7	..	Bridge over R. Lippach.	Ditto
10.4	..	..	Line curves sharply right and runs SE.
11.1	..	Bridge over tributary of R. Donau.	Line curves NE.
11.3	..	..	Line runs ESE to Fridingen.
13.0	..	Bridge over R. Donau.	
13.9	..	Ditto	Line crosses road before station.
14.0	FRIDINGEN (B. TUTTLINGEN)	..	SER. Wb (32 t). Cr (1.5 t).
14.9	..	Bridge over R. Bara.	Line crosses road.
15.0	..	Tunnel.	c. 700 m. long. Line runs NE.
16.8	..	Bridge over R. Donau.	Line curves ESE.
17.3	..	Road overbridge.	
17.6	BEUMON	..	SER. Wb (32 t). Line curves NE.
18.0	..	..
19.1	..	Bridge over R. Donau.	
19.2	..	Road overbridge.	Line crosses road.
19.4	..	..
22.1	..	Road overbridge.	
23.0	HAUSEN-IM-FAL	..	SER. Wb (32 t). Line crosses road.
24.3	..	..	Line curves very sharply and runs SE.
27.3	..	..
27.5	..	Bridge over stream.	Line curves E, then SE.
27.6	..	..	Line crosses road.
27.7	..	..	Line crosses road.
27.8	..	Road overbridge.	Line crosses road.

Km.	Stations	Engineering works	Details and facilities
30.8 *31.2	THIERGARTEN (HORNZ)	Bridge over R. Donau.	SER. Wb (32 t). Cr (10 t). Line runs SSE. Line crosses road. Line crosses road twice.
*31.9 *32.6	..	Ditto Ditto	Line runs SE to station. Line crosses minor road.
33.3 33.8 *34.7	GUTENSTERN	.. Ditto	SER. V.b (32 t). Line curves NE. Line curves ESE and crosses main road to Sigmaringen. Line crosses minor road. Line recrosses main road to Sigmaringen.
36.2 *36.3	..	..	J (trailing) left, with ST s.o. line from Tübingen (81.4 km.) on the Horb-Plochingen line (Route 115). Line curves SE. Line curves left and runs NE to station.
37.3 *39.3	INZIKOFEN	Line crosses arm of R. Donau.	Wb (30 t). Line crosses road.
39.7 41.1	..	Road overbridge. Ditto	Ditto
41.5 *41.8	..	Road overbridge. Bridge over R. Donau.	Line curves right and runs SE into Sigmaringen station. Line crosses road. Ditto
42.4	SIGMARINGEN	..	SER. Wb (35 t). Cr (2.5 t). There is a separate station for a standard gauge ST s.o. light railway to Gammertingen (23.1 km.). From Gammertingen one branch goes to Kleinengstingen, 19.7 km. from Gammertingen, and the other branch to Eyach, 54.9 km. from Gammertingen (Eyach is on the Horb-Plochingen line (Route 115)). Line runs SE.
*42.6 43.2	..	Bridge over R. Donau.	J (facing) right, with ST s.o. line to Stahringen on the Radolfzell-Ulm line (Route 117). Line crosses road. Line crosses road by station.
43.9 46.1 *46.1	SIGMARINGENDORF	Road overbridge.	SER. Wb (32 t). J (facing) left, with ST s.o. standard gauge light railway connection to line from Sigmaringen Privath. to Gammertingen.
*46.2	..	Bridge over R. Lauchert.	Line crosses 4 roads and curves E. Line curves ENE. Line curves SSE and runs in that direction to Scherz.
47.1 48.1	..	..	Line crosses road.
*48.1	..	Bridge over R. Elz.	SER. Wb (32 t). Line crosses 4 roads.

Km.	Stations	Engineering works	Details and facilities
51.1	ENNETALH	..	Passenger station. Line crosses 2 minor roads.
51.6	..	Bridge over R. Alblach.	J (trailing) right, with ST s.o. connection from Sigmaringen-Radolfzell line.
51.9	..	..	..
52.0	..	Bridge or culvert over stream.	Line crosses minor road. Line crosses road to Herberlingen at station.
52.6	MENGEN	..	SER. Wb (32 t). Cr (2.5 t). Line crosses 2 roads.
56.6	..	Bridge or culvert over stream.	..
57.4	..	Ditto (Mühlbach)	..
57.8	..	Bridge or culvert over stream.	..
58.6	HERBERTINGEN	..	SER. Wb (31 t). Cr (2.4 t). J (facing) right, with ST s.o. line to Aulendorf (28.0 km.) on the Radolfzell-Ulm line (Route 117). Line crosses main road to Saulgau. Line curves ENE.
59.2	..	..	..
59.6	..	Ditto	..
59.9	..	Ditto (Gsaitbach)	..
60.6	..	Ditto (Gsaitbach)	..
62.4	..	Ditto (Gsaitbach)	..
62.4	..	Bridge or culvert over stream.	Line crosses road.
64.0	ERTINGEN	..	SER. Wb (32 t). Cr (2t). Line crosses minor road.
67.3	NEUTRA (DONAU)	..	..
68.3	..	Ditto	Line crosses road.
69.3	..	..	..
69.8	RIEDLINGEN	..	SER. Wb (32 t). Cr (3 t). I for ST s.o. narrow-gauge (0.75 m.) line to Schussenried (29.4 km.) on the Radolfzell-Ulm line (Route 117). Line passes over or under above-mentioned narrow-gauge line.
72.0	..	Fly-over.	..
72.7	..	Bridge or culvert over stream.	..
72.9	..	Ditto	Line crosses road.
73.3	UNLINGEN Bf	..	SER. Wb (1.6 t). Line curves NNW. Line crosses minor road. Line curves NE and runs in that direction to Zwiefaltendorf.
75.8	..	..	..
76.3	..	Bridge over R. Donau.	..
77.3	ZWIEFALTENDORF	..	SER. Wb (32 t). Cr (15 t).
77.6	..	Ditto	Line crosses road.
77.7	..	Bridge or culvert over stream.	..
79.9	..	..	Line crosses 2 roads. Just before station.
..	..	Bridge over R. Donau.	..
82.4	REHMENSTEN	..	SER. Wb (32 t). Cr (1.6 t).
84.7	..	Bridge or culvert over stream.	Line crosses road at station.
87.2	UNTERBREMEN	..	SER. Wb (32 t). Cr (1.6 t).

Km.	Stations	Engineering works	Details and facilities
90.0	MUNDERKINGEN	..	SER. Wb (32 t). Cr (1.5 t). Line runs S.E. Span after station. Line crosses road.
		Bridge or culvert over stream.	
91.9	..	Ditto	Line curves N.E.
92.3	..	..	Line crosses road.
94.3	ROTTENACKER	..	SER. Wb (32 t). Cr (2 t).
95.0	..	Ditto	Line crosses road.
97.4	..	Ditto	Line crosses minor road just before station.
98.1	DETTINGEN (S. EHINGEN)	..	Restricted goods facilities. Line curves N. Line crosses road after station. Line curves NNW.
98.7	..	..
99.8	..	Bridge over stream.	Bridge over minor road. Line curves NE and runs in that direction to Ehingen station.
100.4	..	..
		Ditto	
100.5	..	Bridge over road.	
100.7	..	Road overbridge.	
101.0	..	..
101.4	EHINGEN (DONAU)	..	SER. Wb (32 t). Cr (2.5 t). Line leaves the valley of the R. Donau.
101.6	..	Bridge or culvert over stream.	
101.9	..	Bridge over road.	
102.4	..	Bridge or culvert over stream.	Line crosses 2 minor roads. E of line there is a (?) tram line to factory.
106.3	..	Ditto	Line crosses minor road.
106.7	ALLMENDINGEN	..	SER. Wb (32 t). Cr (1.6 t). Line crosses minor road after station.
107.2	..	..	Line passes under (?) cable line between factories.
107.5	..	Ditto	Line crosses minor road.
110.5	..	Ditto (Schmiech)	
110.8	SCHMIECHEN	..	Passenger station. Line crosses road after station.
*111.2	..	..	Line converges with ST & O. line from Reutlingen on the Horb-Plochingen line (Route 115). (From Honau to Lichtenstein 2.2 km. of this line is rack railway.) Line crosses minor road.
*112.1	..	..	J (trailing) left with above-mentioned line.
112.3	SCHLICKLINGEN	..	SER. Wb (32 t). Cr (1.6 t). There is a tram line running from here for 4 km. along the E side of the line. Line crosses 2 minor roads.
*112.2	..	Bridge over R. Ach.	
111.6	..	Bridge or culvert over stream.	Line crosses road.
112.0	..	Bridge over R. Ach.	Line crosses right of way E to station.
111.4	..	..
*112.5	..	Bridge over R. Ach.	

Km.	Stations	Engineering works	Details and facilities
118.5	BLAUBRÜNNEN	..	SER. Wb (32 t). Cr (3 t). From here S of the line there is a (?) cable railway c. 4 km. long. Line crosses minor road after station. Line follows R. Blau to Herrlingen.
*119.2	..	Road overbridge. Bridge over R. Blau.	Line crosses road.
119.7	GERHAUSEN	..	Passenger halt. (?) Tramline S of line c. 1.5 km. long.
121.7	..	..	Line crosses main road. (?) Tramline S of line c. 1 km. long.
		Bridge over R. Blau.	Line crosses minor road. Immediately before station.
127.5	HERRLINGEN	..	SER. Wb (35 t). Cr (3 t). Line crosses minor road.
128.3	KLINGENSTEIN	Road overbridge.	Passenger halt. By Ehrenstein station.
129.3	EHRENSTEIN	..	Passenger station.
129.9	..	Bridge or culvert over stream.	
130.2	..	Ditto	Line crosses minor road.
131.8	..	Bridge over river.	
132.3	..	Road overbridge.	
*132.6	ULM-SOFLINGEN	..	J (facing) right, with lines to MY and Western Loco. Depot and main goods station.
133.3	..	Road overbridge.	J (trailing) right with line from MY.
*134.2	..	Fly-over.	Line passes under DT electrified line to Stuttgart (Route 82).
		Road overbridge.	
*134.6	..	..	J (trailing) left with Route 82.
134.8	..	Road overbridge.	J (trailing) left, with DE sidings.
*135.0	ULM Hbf	..	Passenger Station. Goods Station: SER. Wb (40 t). Cr (20 t). MY (alongside this line). Loco. Depot: 2 ES (1 RH). Tbls. RpS. Loco. Depot in MY: 2 ES (1 RH). 2 Tbls. For details of station see Route 117 also Plan 41 and 41a.

ROUTE 117

RADOLFSZELL-FRIEDRICHSHAFEN-AULENDORF-ULM

General Description

Linking up with Route 112 (Offenburg-Konstanz), this line provides the main service from Konstanz and Friedrichshafen to Ulm, where it connects with Route 82, and Stuttgart.

From Radolfzell, J for Konstanz, the line runs N through slightly hilly country to Stahringen when it crosses the delta of the Stockacher-Aach to run along the N shore of Lake Konstanz to Oberuhldingen, where it deviates inland to Friedrichshafen.

From Friedrichshafen the line runs N and DT along the valley of the Schömen to its source just N of Aulendorf, when it crosses into the Riss valley to the rivers confluence with the Danube at Erbach, whence it follows the Danube to Ulm.

Gradients are slight and have a tendency to rise to Aulendorf and thence fall to Ulm (see Plan 52).

Principal junctions are at Radolfzell, for Konstanz, Friedrichshafen for Lindau (Route 117a), Aulendorf for ST lines W to Herbertingen and E to Memmingen, and at Ulm for the Stuttgart-München main line.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.

2. LENGTH: 152.6 km. (101 miles).

3. TRACK:

Radolfzell-Stahringen (8.0 km.), double.
Stahringen-Friedrichshafen (50.9 km.), single.
Friedrichshafen-Ulm (103.7 km.), double.

4. MAXIMUM PERMITTED AXLE LOAD:

Radolfzell-Oberuhldingen-Mülhofen
(33.5 km.), 20 metric tons.

Oberuhldingen-Mülhofen-Mimmenhausen-
Neufrach (33.4 km.), 18 metric tons.
Mimmenhausen-Neufrach-Ulm, 20 metric
tons.

5. MAXIMUM GRADIENT: 10 per mille (1 in 100) (see Plan 52).

6. MINIMUM RADIUS OF CURVES: 299 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

7.1 km. (4½ miles).
Between Radolfzell and Stahringen.

9. ENGINE SHEDS:

Radolfzell. Friedrichshafen. Ulm.

10. MARSHALLING FACILITIES: Ulm.

11. WATERING FACILITIES: See 9 above. No other details.

12. VULNERABLE POINTS:

(a) Locomotive sheds and marshalling yards given in 9 and 10 above.

(b) Junctions at Radolfzell, Friedrichshafen, Aulendorf and Ulm.

(c) Bridges at 12.2, 35.3, 40.2, 65.9, 73.2, 75.4, 145.6 and 150.2 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Radolfzell- Friedrichshafen (throughout)	12-16	350
Friedrichshafen-Ulm	48	400

Distances from Radolfzell

Km.	Stations	Engineering works	Details and facilities
230.3	KARLSRUHE	..	Routes 112, 111, and 75.
159.3	OFFENBURG	..	Route 112.
0.0	RADOLFSZELL	..	SER. Wb (40 t). Cr (10 t). ES. Tul. W. DT line for 8 km., then ST to Friedrichshafen. Line crosses several roads in town. J (facing) right, with DT s.o. line to Konstanz-Petershausen. Line crosses 2 minor roads.
0.9	..	..	Line crosses 2 minor roads.
2.7	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
5.3	..	Ditto	Line crosses minor road.
7.1	STAHRINGEN	..	SR. Wb (35 t). Line crosses minor road.
8.0	..	Ditto	J (facing) left, with ST s.o. line to Mengen (49.0 km.) on the Tutt- lingen-Ulm line (Route 115). DT ends and line continues single as far as Friedrichshafen. Line curves right and then runs E to Ludwigshafen. Line crosses minor road.
12.2	..	Bridge over R. Stockacher- Aach and minor road.	

Km.	Stations	Engineering works	Details and facilities
12.5	EPPENINGEN	..	SR. Wb (35 t). Line crosses 2 minor roads.
14.4	..	..	Line runs SE along the shore of Lake Konstanz for c. 17 km.
15.6	LUDWIGSHAFEN (BODENSEE)	..	SER. Wb (35 t). Cr (6 t).
		Bridge or culvert over stream.	
19.7	SIPPLINGEN	..	SR. Wb (35 t). Cr (4 t).
21.9	SÜDENMÜHLE	..	Passenger station.
24.6	ÜBERLINGEN	..	SER. Wb (35 t). Cr (6 t). Line crosses several minor roads in town.
26.7	ÜBERLINGEN ORT	..	Passenger station. Line crosses road.
28.5	NUNDORF (BADEN)	..	SR. Wb (40 t). Line crosses road.
		Bridge or culvert over stream.	
			Line crosses 2 minor roads.
31.3	BIRNAU-MAURACH	..	Passenger station. Line leaves shore of Lake Con- stance.
32.9	..	..	Line crosses minor road. J (trailing) right, with ST s.o. dead- end line to Unteruhldingen (2.6 km.) (axle load 14 t). Line crosses 2 minor roads.
33.5	OBERUHLINGEN- MÜHLHOFEN	..	SER. Wb (40 t). Cr (6 t). Line crosses minor road.
34.6	MÜHLHOFEN ORT	..	Passenger halt. Line crosses several minor roads.
36.7	GRASBEUREN	..	Passenger station.
		Bridge or culvert over stream.	
			Line crosses 2 minor roads.
*39.3	..	Bridge over R. Aach. Bridge or culvert over stream.	
39.4	MIMMENHAUSEN- NEUTRACH	..	SER. Wb (40 t). Cr (6 t).
40.0	..	..	J (facing) left, with ST s.o. dead- end line to Frickingen (3.2 km.) (axle load 14 t). Line crosses minor road.
40.2	..	Bridge over R. Degen- hauser Aach.	
			Line turns and runs SE to Friedrich- shafen.
41.6	MITTELSTENWEIER	..	Passenger station.
		Bridge or culvert over stream.	
			Line crosses minor road.
44.5	BIRMATINGEN-AHAUSEN	..	SR. Wb (40 t). Cr (6 t). Line crosses minor road.
44.9	..	..	Line crosses 4 minor roads.
45.3	..	..	Line crosses minor road.
45.7	..	..	Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
42.2	MARKLOFF (BALEN)	..	SER. Wb (40 t). Cr (6 t). Line crosses minor road.
42.6 51.4	..	2 bridges or culverts over streams.	Line crosses minor road.
51.9 52.1	KLUPTERN	Bridge or culvert over stream.	SR. Wb (35 t). Line crosses 2 minor roads.
53.9 54.8	FISCHBACH (BODENSEE)	..	SER. Wb (32 t). Line crosses main road to Friedrichshafen. Line crosses minor road.
		Ditto	
55.3	MANZELL	..	Passenger station. Line crosses 2 minor roads.
56.2	SEEMOOS	..	Passenger halt. Line crosses several minor roads.
58.2	..	..	Line crosses main road into Friedrichshafen.
		Road overbridge.	Line crosses numerous roads in the town.
58.9	FRIEDRICHSHAFEN STADT	..	SER. Wb (40 t). Cr (10 t). ES. Tbl. W. RpS. DT line to Ulm. Line crosses roads in town.
59.2	..	..	J (facing) right, with connection to harbour station. Line proceeds N along valley of R. Schausen to Aulendorf.
60.3	..	..	J (right) with ST s.o. line to Lindau (22.5 km.) (Route 117a). Also J (facing) left, with s.o. standard gauge light railway to Oberteuringen (10.7 km.).
		Bridge or culvert over stream.	Line crosses 2 minor roads.
61.1	LOWENTHAL	..	Passenger station.
64.1	GERBERTSHAUS	..	Restricted goods facilities. Line crosses minor road.
64.4	..	Ditto	
65.5	KYHLEN	..	Passenger halt. Line crosses minor road.
65.9	..	Bridge over R. Schausen.	
67.5	MICKENBEUREN	..	SER. Wb (40 t). Cr (12 t). J (trailing) right, with ST electric dead-end line to Tettnang (4.3 km.). Carrying rail road. Line crosses 3 minor roads.
72.1	..	Bridge or culvert over stream.	
73.1	..	Bridge over R. Schausen.	Line crosses minor road.
		Bridge or culvert over stream.	
	
	

Km.	Stations	Engineering works	Details and facilities
75.0	WEIMENAU	..	Passenger station. Line crosses minor road.
		Bridge or culvert over stream.	Line crosses road.
76.2	RAVENSBURG	..	SER. Wb (32 t). Cr (20 t). J (facing) right, with ST electric narrow-gauge line Baienfurt (6.6 km.). Line crosses road. Line crosses 2 minor roads.
80.7 81.3 81.5 82.0	..	4 bridges or culverts over streams.	
83.1	..	Bridge or culvert over stream.	Line crosses minor road.
83.5	NIEDERBIBINGEN	..	SER. Wb (32 t). Cr (20 t). Line crosses road. J (trailing) right, with ST s.o. dead-end line to Baienfurt (3 km.) and Weingarten (5 km.), and thence to Regensburg as narrow-gauge line (electrified).
84.2 84.7	..	2 bridges or culverts over streams.	Line crosses minor road.
85.8	..	Bridge or culvert over stream.	Line crosses 3 minor roads.
88.2	MOCHENWANDEN	..	SER. Wb (32 t).
93.0	DURLENBACH	6 bridges or culverts over streams.	SER. Wb (32 t).
99.7	..	..	J (trailing) left, just before Aulendorf station with ST s.o. line from Herbertingen (28 km.) on the Tuttlingen-Ulm line (Route 116).
100.0	AULENDORF	..	SER. Wb (32 t). Cr (18 t). Line crosses 2 minor roads.
100.3	..	..	J (facing) right, just after station, with ST line to Memmingen (72.5 km.) on the Kempten-Neu Ulm line (Route 118).
101.7 102.8	..	2 bridges or culverts over stream.	Line crosses 2 minor roads.
103.1	SCHUMENRIED	..	SER. Wb (32 t). Cr (2 t). J (facing) left, with ST s.o. narrow-gauge (0.75 m.) line to Riedlingen (29.4 km.) on the Tuttlingen-Ulm line (Route 116). Line crosses minor road.
		Bridge or culvert over stream.	Line crosses minor road.
103.0	WATTENWEILER	..	Passenger station. Line crosses 2 minor roads.
112.1	..	Bridge or culvert over stream.	
112.6	ESSENHOF	..	SER. Wb (32 t). Cr (2 t). Line continues along valley of R. Riss to F. Bach. Line crosses 2 minor roads.
113.7	..	..	Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
115.7	HECHINGEN (Rim)	..	SER. Wb (32 t). Line crosses minor road.
117.7	SCHWENNINGEN	..	Restricted goods facilities.
117.9	..	Bridge or culvert over stream.	
120.8	UMMENDORF	..	SER. Wb (32 t). Cr (1 t). Line crosses minor road.
121.7	..	Ditto	
123.2	..	3 bridges or culverts over streams.	
123.5	..		
123.8	..		Line crosses minor roads.
124.1	..	Ditto	
			Line crosses main Biberach-Ochsenhausen road.
125.1	BIBERACH (Rim)	..	SER. Wb (33 t). Cr (5 t).
125.4	..	Bridge or culvert over stream.	
126.8	..	Ditto	
127.7	..	Ditto	
128.3	WARTHAUSEN	..	Wb (32 t). SER (only 7 m. long). Line crosses minor road at station.
		Ditto	
129.1	..	..	J (facing) right, with ST s.o. narrow-gauge (0.75 m.) dead-end line to Ochsenhausen (18.2 km.). Line crosses minor road.
		Ditto	
130.4			
132.4	LANGENKIRCHENBERG	..	Wb (40 t). ER (only 7 m. long). Line crosses 2 minor roads at station.
		Ditto	
132.9	..	Ditto	
134.0	..	Ditto	
135.1	..	Ditto	
135.3	SCHWENNINGEN	..	SER. Wb (32 t). Cr (116 t).
135.6	..	Bridge or culvert over stream.	
137.7	..	Ditto	
138.2	..	Ditto	Line crosses road just before Laupheim West station.
140.1	LAUPHEIM WEST	..	SER. (less than 7 m. long). Wb (32 t). Cr (2 t). J (trailing) right, with ST s.o. dead-end line to Schwendi (16 m.).
140.6	..	Ditto	Line crosses secondary road.
144.5	RISTEN-ACHSTETTEN	..	SER. Wb (32 t). Cr (2 t). Line crosses secondary road.
*145.6	..	Bridge or culvert over R. Rauglen.	Line crosses 4 minor roads.
148.5	DELMENHAGEN	..	Passenger station.
149.9	..	Bridge over waterway.	Line crosses minor road.
*150.2	..	Bridge over R. Donau.	Line continues along valley of Danube to Ulm.
		2 bridges or culverts over streams.	
151.4	ERBACH (WERT.)	..	SER. Wb (32 t). Cr (2 t).
		Bridge or culvert over stream.	Line crosses road. Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
154.7	ERDMORN	..	SER. Wh (33 t). Line crosses secondary road. Shortly after station. Line crosses main Ulm-Ehringen road.
155.0	..	Ditto	Line crosses minor road.
157.1	ULM-GRIMMELSTADEN	Road overbridge at station.	Restricted goods facilities. Line crosses minor road.
158.3	ULM DONAUTAL	..	Passenger station. Line crosses roads in Ulm.
*161.7	..	Bridge or culvert over stream.	J (trailing) right, with DT electrified line München-Stuttgart (Route 88). J (facing) left with line to MY.
162.6	ULM Hbf.	..	<p>Passenger Station: 2 island platforms (1 x c. 425 m., 1 x c. 340 m.). 2 single-faced platforms c. 425 m. long, with platform at S end with 3 tracks c. 250 m. long. At least 5 through tracks. Carriage Sidings: W of station, c. 14 LS c. 800 m. long, possibly also used for reception and departure roads in connection with MY. Also c. 14 DES c. 300 m. each, NE of station and S of Stuttgart line, used for storage of passenger coaches and ambulance train; connections at W end to passenger station. Goods Stations: SER. Wb (40 t). Cr (20 t). 2 separate stations— (1) N of and adjoining main passenger station—designated East Goods Station. Goods shed c. 140 m. x c. 40 m., with at least 2 platforms extending to c. 250 m. 3 DES on W side for storage, length c. 300 m. 3 DES on E side, 2 with road access, c. 300 m. each. (2) NW of passenger station with access W from MY. Goods shed covering area c. 250 m. x 100 m. comprising— 3 main covered platforms 250 x 30 m., 240 x 20 m., 220 x 30 m., served by 12 DES c. 425 m. long. N of 1st: 3 groups of DES c. 3 x 160 m., 2 with road access, c. 4 DES c. 250 m. long, 2 with road access, c. 4 DES c. 380 m. long, 2 with road access. S of 1st: 3 DES c. 650 m. long, connected at W end to storage sidings, one with road access, one with connection at E end to turntable c. 13 m. diameter, one serving c. 12 DES each c. 140 m. long, most with road access and small spur siding to SER. Further S of end 2 DES c. 250 m. long, possibly for passenger siding only, with connection to central established road S of yard.</p>

Km.	Stations	Engineering works	Details and facilities
			<p>Loco Depot: In junction triangle formed by Stuttgart and Schellkingen lines—a ES ($\frac{1}{2}$ RH) each with holding capacity 20-25 locos, with turntables c. 18 m. diameter. Workshops attached—access to depot from S.</p> <p>A further depot exists in MY, comprising a ES ($\frac{1}{2}$ RH). Capacity 20-25 locos each, with a Tbl (22 m.). Coal road with wet ash pit E of depot extending along MY; length of stage c. 250 m., length of ash pit c. 300 m.</p> <p>Marshalling Yard: Alongside and S of Schellkingen line.</p> <p>Reception and Departure Roads: N of loco depot, c. 10 LS c. 1,100 m. long.</p> <p>Marshalling Sidings: S of loco depot, c. 20 LS 600-750 m. long.</p> <p>Soring Sidings: W end of marshalling sidings, c. 10 LS c. 210-300 m.</p> <p>Storage Sidings for Goods Yard: c. 12 LS c. 300 m. long.</p> <p>Reception and Departure Sidings: W end, 5 LS c. 600 m. long, with a further group of newly constructed sidings to the W, comprising c. 10 LS, c. 600-900 m.</p> <p>For location diagram of facilities at Ulm, see <i>Plan 41</i>, and for air photographs, <i>Plan 41a</i>, and <i>Appendix 3 of Report C/317</i>.</p>

ROUTE 117A FRIEDRICHSHAFEN-LINDAU

General Description

This line runs along the N side of Lake Konstanz and joins the Radolfzell-Friedrichshafen-Ulm line (Route 117) to the Lindau-Augsburg line (Route 120). There are no gradients of any consequence.

Principal junctions: Friedrichshafen for the Radolfzell-Friedrichshafen-Ulm line; Lindau for the DT s.o. Lindau-Augsburg line (Route 120), and the ST s.o. line to Bregenz.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 23.9 km. (14½ miles).
3. TRACK: Single.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 8 per mille (1 in 125).
6. MINIMUM RADIUS OF CURVES: 300 m.
7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

Friedrichshafen-Eriskirch 5.8 km. (3½ miles).

9. ENGINE SHEDS:

Lindau. Friedrichshafen.

10. MARSHALLING FACILITIES:

Friedrichshafen (SY). Lindau (SY).

11. WATERING FACILITIES:

Lindau. Friedrichshafen.

12. VULNERABLE POINTS:

- (a) Locomotive sheds at Friedrichshafen and Lindau.
- (b) Repair shops at Friedrichshafen.
- (c) Junctions at Friedrichshafen and Lindau.
- (d) Bridges at 1.5, 6.3 and 10.8 km.

13. CAPACITY:

<i>Trains per day</i>	<i>Net train load tons</i>
<i>civil use</i>	<i>military stores</i>
12-16	350

Distance from Friedrichshafen

Km.	Stations	Engineering works	Details and facilities
250.6	BREITEN	Routes 117, 82, 70.	<p>Passenger and goods station. Repair shops (loco and electric railcars). SER. Wb (40 t). Cr (10 t). ES. Tbl. W. <i>Passenger Station:</i> 3 platforms (2 island) up to 250 m. long. 6 through tracks. Bays at each end of single-faced platform for local trains. <i>Repair Shops:</i> Situated N of station—loco and electric railcars; extensive works fitted with traverser and equipped for heavy repairs; served by trailing connection from W end of shunting yard. <i>Loco:</i> ES—exact location unknown but probably, in addition to RpS, a rectangular shed exists N of harbour station. Tbl (25 m.) at W end of station, S of RpS. Tbl (25 m.) at E end of station in triangle formed by connection to harbour station. Also in triangle, water tower and coal stage. <i>Shunt Yard:</i> N of line, and immediately E of station. 3 LS c. 800 m. long. 3 LS c. 800 m. long. 3 LS c. 350 m. long. <i>Goods Station:</i> SER. Wb (40 t). Cr (10 t). 3 LS for storage c. 550 m. long. 1 LS (350 m.) serving goods shed (200 x 25 m.), together with 2 DES. 2 DES (c. 450 m.) with access from E end of yard and 2 short spurs at W end, giving 4 tracks in all, serving SER. Private siding connections to industrial establishments N side of town, including gas works, Maybach Motorenbau works, and Luftschiffbau works. <i>Harbour Station:</i> Served by connection E end of main station. Terminus station with 2 platforms (1 single-faced). Goods yard adjoining comprises 3 DES (c. 200 m.); 3 DES (c. 100 m.); 2 DES (c. 75 m.). Line crosses some roads in the town. J (facing) right with connection to harbour station. J (facing) left with DT 200 ft. to Ulm, and with co. standard gauge light railway to Oberlin (c. 10 km.).</p>
152.8	STUTTGART	Routes 117, 82.	
105.6	ULM	Route 117.	
58.7	RADOLFELE	Route 117.	
0.0	FRIEDRICHSHAFEN	..	
0.3	..	..
0.7	..	..
1.1	..	..
		Bridge over road.	

RAILWAYS

	Stations	Engineering works	Details and facilities
1.5	..	Bridge over stream (Richtach).	Line crosses main road. c. 75 m. long. Line follows shore of the Bodensee (Lake Konstanz) and runs SE to Langenargen. Line crosses minor road. Line crosses main road to Lindau.
2.8	..	..	SER. Wb (32 t).
3.8	ENNEKIRCH	Bridge over R. Schumen.	Line crosses 5 roads.
6.3	..	..	SER. Wb (32 t). Cr. (4 t). Line runs E for c. 3.5 km. and then SE.
9.5	LANGENARGEN BHF.	..	..
10.8	..	Bridge over R. Argen.	..
11.7	..	Bridge or culvert over stream.	Line crosses minor road, curves right and crosses main road.
13.6	..	Ditto	..
13.7	KEMPRON BHF.	..	SER. Wb (32 t). Cr. (2 t). Line crosses 2 minor roads.
16.2	NONNENHOLZ	..	SER. Wb (30 t). Line crosses 3 minor roads.
18.3	WASSERBURG (BODENSEE)	..	SER. Wb (40 t). Cr. (1.5 t). Line crosses 3 minor roads.
20.0	..	Ditto	..
20.5	ENZWEILLEN	..	SER. Wb (30 t). Line crosses minor road.
21.6	..	..	J (trailing) left with DT s.o. line from Kempten and Augsburg (Route 120).
22.2	LINDAU-ARSENACH	..	Passenger station. Line crosses minor road.
22.4	..	..	J (facing) right with ST s.o. line to Bregenz.
22.7	..	..	J (trailing) left with connection from ST s.o. line to Bregenz (Route 121).
		Causeway over Bodensee immediately after trailing connection.	c. 350 m. long.
23.9	LINDAU Hbf. (BODENSEE)	..	Station facilities. Passenger station: 4 island platforms 300 m. long. Loco Depot: W of passenger station. ES 1 RH, depth 27 m., stabling capacity c. 25. Tbl (27 m). W. Served by 2 LS (each 225 m.), from carriage sidings. Carriage Sidings: SW of passenger station, 12 DES each 250 m. long, connection to Loco Depot. Goods Yard: NE of passenger station, c. 5 DES each 160 m. long. Wb (40 t). Storage Sidings: NW of passenger station, c. 8 LS each 225 m. long. (From Lindau Hbf. to Bregenz German-Austrian loading gauge is permissible only to height of 1,500 mm. for hay, straw and other easily inflammable goods). At Lindau, inter-connection with Bodensee (Lake Konstanz) steamship services.

ROUTE 118

KEMPTEN-MEMMINGEN-NEU ULM

General Description

Connecting with Route 120 (Lindau-Augsburg) at Kempten and Route 82 at Ulm, this route forms part of the main line from Lindau and Switzerland to Frankfurt via Karlsruhe, Heidelberg and Mannheim.

The line runs in a northerly direction following the valley of the R. Iller throughout, and gradients are consequently not of a serious nature.

The principal junctions are at Kempten with the Lindau-Augsburg line (Route 120), at Memmingen with the ST main line to Büchloe and München (Route 119), and the ST branch line from Aulendorf (on Route 117), and Herpitz (on Route 120), and at Neu Ulm with the main München-Stuttgart line (Route 82).

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 85.0 km. (53½ miles).
3. TRACK: Single.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
 - Kempten (Allgau) Hbf-Memmingen, 20 metric tons.
 - Memmingen-New Ulm, 18 metric tons.
5. MAXIMUM GRADIENT: 7 per mille (1 in 140).

6. MINIMUM RADIUS OF CURVES: 200 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

8.9 km. (Kempten-Herpitz).

9. ENGINE SHEDS:

Kempten. Memmingen. Neu Ulm.

10. MARSHALLING FACILITIES:

Kempten. Memmingen. Ulm.

11. WATERING FACILITIES:

Kempten. Memmingen. Ulm. Neu Ulm.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Marshalling facilities and locomotive sheds as in 9 and 10 above.

(b) Repair shops at Neu Ulm.

(c) Junctions at Kempten (0.4 and 0.8 km.), Memmingen (34.1 and 36.6 km.), Neu Ulm (84.4 km.).

(d) Electric transformer station.

(e) Bridges at 0.7 km. (Iller), 38.8 km.

13. CAPACITY:

Trains per day each way	Net train load tons military stores
12-16	350

Distances from Kempten

Km.	Stations	Engineering works	Details and facilities
0.1	LINDAU	Route 120.	
0.4	KEMPTEN (ALLOAU)	..	SER. Wb (40 t). Cr (10 t). MY. ES. Tbl W. J for DT s.o. lines to Lindau, Augsburg, and München, also ST line to Reutte (Tirol) and ST branch line to Leutkirch. Line runs SE.
0.7	..	Bridge over R. Iller.	J (facing) right, with ST s.o. line to Sibrathshofen (distance 27.9 km.). Also, J (facing) right, with DT s.o. line to Lindau (Route 120). Line curves E.
0.8	152 m. long, 1 main span x 63.8 m., also 3 x 21.3 m. Height 36 m. Built 1905. Concrete three-hinged arches. Double track.
0.9	J (trailing) right, with DT s.o. line from Lindau (Route 120).
1.1	J (facing) right, with ST s.o. line to Pfirten-Steinach (distance, 33.0 km.). Line crosses main road and curves NE.
1.8	..	Bridge or culvert over stream.	J (facing) right, with DT s.o. line to Augsburg (Route 120).
1.9	Line curves NW.
5.0	Line crosses main road.
5.1	..	Ditto	Line turns N.
5.2	..	Ditto	..
7.2	Line crosses 575 m. viaduct line.
7.5	..	Ditto	..
8.9	HERPITZ	..	SER. Wb (40 t).
9.3	..	Bridge or culvert over stream.	..

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
9.8	..	..	Line crosses main road and runs beside it, curving NW.
10.2	..	Bridge or culvert over stream.	
12.0	..	Ditto	Line leaves main road.
13.1	DIETMANNHARD	..	SER. Wb (40 t).
13.4	..	..	Line crosses main road.
14.7	..	..	Line crosses 700 m. contour line.
16.3	..	..	Line gradually curves N skirting marshy ground.
16.4	REICHOLZBERG	..	Passenger station.
17.3	..	..	Marshy ground ends.
21.8	GRÖNENBACH	..	SER. Wb (40 t).
22.0	..	..	Line crosses 675 m. contour line.
23.3	..	..	Line crosses main road.
24.8	..	..	Line curves NW.
27.6	WÖRNIGEN (SCHWAB)	..	SR. Wb (40 t).
28.5	..	Bridge or culvert over stream.	
29.9	..	..	Line crosses 625 m. contour line.
30.9	..	..	Line turns NNW.
33.3	..	..	Line curves N.
33.4	..	..	J (facing) right, with two ST s.o. DE sidings to industrial concerns (distances 0.4 and 0.3 km.).
34.0	..	..	J (facing) right, with ST s.o. DE siding to industrial concern (distance 0.6 km.).
34.1	..	..	J (trailing) left, with ST s.o. line from Leutkirch (31.7 km.), Kieselgg (42.7 km.), J for Aulendorf (72.4 km.) on Route 117, and Hergatz (61.3 km.) on Route 120. Also, J (trailing) left, with ST s.o. DE line from Leuga (distance 16.9 km., axle-load 12.5 t).
			Line crosses 600 m. contour line.
34.9	MEMMINGEN	..	<p>Passenger Station: 2 platforms, c. 250-300 m. 3 through tracks.</p> <p>Goods Yard: S of passenger station and E of line.</p> <p>Group of 10 DES c. 270 m. long.</p> <p>SER. Wb (40 t). Cr (10 t).</p> <p>A further subsidiary yard W of the line with short DES serving sheds.</p> <p>Loco. Depot: W of line between J of Tannheim and main line.</p> <p>ES 1 RH. Tbl (21 m.). W.</p> <p>Shed Yard: Group of c. 6 LS (400 m.) adjacent loco depot and 6 LS (400 m.) E of line and N of goods yard.</p> <p>Repairs: 2 small repair shops, one N of goods yard and the other W of Tannheim line.</p>
35.3	..	..	Line crosses main road.
36.0	..	..	J (facing) right, with ST s.o. line to Buchloe (Route 119).
38.3	..	Bridge or culvert over stream.	Line curves NW.
41.1	HEIMERTINGEN	..	SER. Wb (40 t).
41.3	..	..	Line turns N.
42.2	..	..	Line crosses main road.
44.0	..	..	Line crosses 725 m. contour line.
45.2	ELTINGEN	..	SER. Wb (40 t).
45.3	Line curves NW.
45.4	..	Bridge or culvert over stream.	

KEMPTEN TO NEU ULM

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Km.	Stations	Engineering works	Details and facilities
48.4	PLEM	..	Passenger station. Restricted cattle facilities. Line crosses main road.
50.5	..	..	J (trailing) right, with ST a.o. DE line from Bahenhausen (distance 10.3 km.).
51.4	KELLMUNZ	..	SER. Wb (30 t). Cr (1.5 t). Line turns NNW.
52.0	..	Bridge or culvert over stream.	
53.4	..	..
56.1	ALTENSTADT (ILLER)	..	SER. Wb (30 t). Line crosses 525 m. contour line.
58.0	..	..	Line turns N.
59.0	..	..
63.0	ILLERTISEN	..	SER. Wb (40 t). Cr (1.5 t).
63.3	..	..
66.7	BELLENBERG	..	Restricted goods and cattle facilities. Line turns NNW.
67.4	..	Bridge or culvert over stream.	
68.8	..	..	Line crosses 500 m. contour line.
68.9	..	..	Line crosses main road.
69.4	VÖHRINGEN	..	SER. Wb (40 t). Cr (0.5 t). Line turns NW.
71.3	..	..	J (trailing) right, with ST a.o. DE line for Weissenhorn (distance 9.6 km.).
74.3	..	..
75.0	SENDEN	..	SER. Wb (40 t). Line turns NNW.
76.2	..	..
78.2	GRÖLENHOFEN	..	Restricted goods and cattle facilities. Line crosses 475 m. contour line.
81.0	..	..	Line curves W.
83.4	..	..	J (trailing) right, with two ST DE sidings from industrial concerns (distances 0.4 and 0.7 km.).
83.8	..	..	J (facing) left, with ST DE siding to industrial concern (distance 0.7 km.).
83.9	..	..	Line joins DT electrified line from München (Route 82) and runs 3-track to Neu Ulm. Sidings served by trailing connection right of line.
84.0	..	..	Line curves W. to Ulm.
85.0	NEU ULM	..	SER. Wb (40 t). Cr (10 t). Loco Depot: S of station, 2 ES (1 RH). Total capacity c. 50 locom. 2 Tbls. W. Shunt Yard: N of station, c. 6 LS. Electric sub-station. Line continues N to Ulm main passenger station as Route 82. MT: Capacity 2,300 wagons per 24 hours at Ulm on line to Schelkingen. RPS (C and W) at Ulm, also main locomotive depot (1 FS 1 RH). For details see Route 82 (amended) and for location diagram, Fig. 11. Electric transformer station, 1 set of line in J triangle formed by Routes 82 and 83.

Km.	Stations	Engineering works	Details and facilities
87.2	ULM	Route 82.	
	HEIDELBERG	Routes 82, 75, 98.	
	MANNHEIM	Routes 82, 75, 98, 87.	
	FRANKFURT	Routes 82, 75, 98, 27, 67.	

ROUTE 119

MEMMINGEN-BUCHLOE-MÜNCHEN

General Description

Together with Route 118, the section Memmingen-Buchloe provides a ST alternative route from Kempten to Buchloe and from Buchloe the line continues to München providing, together with Route 120, the main line service from Lindau and Zürich to München, Leipzig and Berlin.

The line proceeds in an easterly direction crossing the general watershed to the N and includes bridges over several rivers, the most important being those over the Günz, Mindel, Wertach, Lech and Amper.

In addition to the important connections at Memmingen, Buchloe and München, junctions at Mindelheim with the line to Günzburg and at Türkheim, Kaufering and Geltendorf with the lines to Gessertshausen, Bobingen and Mering, provide less important branch line services.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 113.1 km. (70½ miles).
3. TRACK:
 - Memmingen-Buchloe (46.1 km.), single.
 - Buchloe-München (113.0 km.), double.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
 - Memmingen-Buchloe, 17 metric tons.
 - Buchloe-München, 20 metric tons.

5. MAXIMUM GRADIENT: 12 per mille (1 in 80).

6. MINIMUM RADIUS OF CURVES: 292 m.

7. TRACTION: Steam.

8. MAXIMUM DISTANCE BETWEEN STATIONS:
11.8 km. (7½ miles).

9. ENGINE SHEDS:

München (Pasing). Memmingen.

10. MARSHALLING FACILITIES:

Memmingen (SY). München Laim.

11. WATERING FACILITIES:

München. Memmingen.

12. VULNERABLE POINTS:

- (a) Marshalling facilities and locomotive depots as in 9 and 10 above.
- (b) Junctions at Memmingen, Buchloe (45.3 and 46.9 km.) and München.
- (c) Electric sub-station at München (Pasing).
- (d) Bridges at 2.6, 7.6, 10.1, 10.8, 18.5, 21.8, 24.4, 25.7, 39.9, 53.1, 59.2, 70.9 and 89.4 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Memmingen-Buchloe	12	300
Buchloe-München	48	300

Distances from Memmingen

Km.	Stations	Engineering works	Details and facilities
34.9	KEMPTEN	Route 118.	
40	MEMMINGEN		SY. SER. Wb (40 t). Cr (10 t). ES (RH). Tbl. W. Rps attached. Junction for ST s.o. line from Aulendorf and Hergatz. For details of facilities see Route 118. Line crosses some minor roads also one main road in the town. J (facing) left with ST s.o. line to Neu Ulm (Route 118).
46		Bridge over R. Weidenbach.	Line crosses minor road.
113	EISENBERG		Passenger station. Line crosses 4 minor roads.
161	SCHWABHAUSEN		Passenger station. Line crosses 4 minor roads.
210		Bridge over R. Krebs Bach.	Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
2.1	UNGERHAUSEN	..	SER. Wb (40 t). Cr (0.75 t). Line crosses main road Memmingen-Mindelheim.
8.3	..	..	J (facing) right with ST a.o. dead end line to Ottobrunen (9.9 km.).
9.8	..	..	..
*10.1	..	Bridge over R. Westliche Ginz.	..
*10.8	..	Bridge over R. Schwelk.	Line crosses 2 minor roads. Line crosses main road.
13.6	SOTHERN (SCHWAB)	..	SER. Wb (40 t). Cr (0.75 t). Line crosses 2 minor roads.
14.6	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
*18.5	..	Bridge over R. Kammlach.	Line crosses minor road.
21.3	STETTEN (SCHWAB)	..	SER. Wb (40 t). Line crosses minor road at station. Line crosses minor road.
*21.8	..	Bridge over R. Westernach.	Line crosses 2 minor roads.
24.4	..	Bridge over R. Westernach.	Line crosses minor road.
25.2	..	Bridge over stream (Brennen).	..
*25.7	..	Bridge over R. Mindel and tributary.	Line crosses secondary road.
25.8	..	..	Line crosses secondary road.
26.4	..	Bridge or culvert over stream.	Line crosses secondary road.
27.5	MINDELHEIM	..	SER. Wb (40 t). Cr (5 t). Line crosses main Mindelheim-Buchloe road.
*27.8	..	..	J (facing) left with ST a.o. line to Günzburg (34.6 km.) on the Stuttgart-München, DT, electrified line (Route 82). Line crosses 2 minor roads and then curves right. Line crosses minor road.
32.0	..	Ditto	Line curves right.
33.4	UNTERRAMMINGEN	..	SR. Wb (30 t). Line crosses 2 minor roads.
		Ditto (Worth).	Line crosses minor road at Türkheim station. J (trailing) right with ST, electrified dead end line from Bad Wörthshofen (axle load 15 t).
37.8	TÜRKHEIM (BAY)	..	SER. Wb (30 t). Line crosses main road E. of station. J (facing) left with ST a.o. line to Gessertshausen (42.4 km.) on the DT electrified Stuttgart-München line (Route 82). Line crosses 2 minor roads.
*39.9	..	Bridge over R. Wertach.	Line crosses 2 minor roads.
42.3	WIEDERGELTINGEN	..	SR. Wb (30 t). Line crosses main road.
43.2	..	Bridge or culvert over stream (Hunger).	South of Buchloe station, J (trailing) right with ST a.o. Augsburg-Lindau line (Route 120).
*45.3	..	..	..
*46.1	BUCHLOE	..	SER. Wb (40 t). Cr (0.75 t). ST electrified line to DT to München. Line crosses minor road.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
*46.9	..	..	J (facing) left with DT s.o. Augsburg-Lindau line (Route 120).
47.1	..	Bridge or culvert over stream (Siechen).	Line crosses minor road. Line crosses main road.
47.9	..	Bridge or culvert over stream.	Line crosses 3 minor roads.
51.1	..	Ditto	Line crosses 3 minor roads.
*53.1	..	Bridge over (R. Singold).	Line crosses minor road.
53.6	IOLING ..	..	SR. Wb (30 t). Line crosses 3 minor roads.
*57.2	..	..	J (trailing) left with ST s.o. line from Bobingen (21.9 km.) on the DT s.o. Augsburg-Lindau line (Route 120).
57.9	KAUFERING ..	..	SER. Wb (30 t). Line crosses main road.
58.4	..	..	J (facing) right with ST s.o. line to Schongau. Line crosses minor road.
*59.2	..	Bridge over R. Lech.	Line crosses 4 minor roads.
62.4	..	Bridge or culvert over stream.	..
62.9	LEFENRACHEN ..	..	SR. Wb (30 t). Line crosses minor road at station. Line crosses 3 minor roads.
67.9	SCHNABACHEN (B. LANGENBERG) (Locn)	..	SER. Wb (30 t). Line crosses minor road.
*70.9	..	Bridge over R. Paar.	Line passes over or under ST s.o. line to Mering on the Stuttgart-München DT, electrified line (Route 82).
71.1	..	Fly-over.	Line crosses minor road. J (trailing) right with line from Mering.
72.0	GAUFING ..	..	SER. Wb (40 t). Line crosses minor road.
72.7	..	..	J (facing) right with ST s.o. line to Weilheim. Line crosses minor road.
74.7	TIENHOF ..	Bridge or culvert over stream (Moll).	SER. Wb (40 t). Falling gradient to R. Amper. Line crosses 2 minor roads.
75.3	..	Bridge or culvert over stream (Moll).	Line crosses 3 minor roads.
81.2	GRAMBACH ..	..	SER. Wb (30 t). Line runs through woods and crosses 3 minor roads.
83.0	SCHNABACHEN ..	..	Restricted goods facilities. Line continues through woods and crosses 2 minor and 1 secondary road.
*84.4	..	Bridge over R. Amper.	Line crosses minor road.
84.9	LECHEN ..	..	SER. Wb (30 t). Line crosses minor road.
85.4	..	..	Line crosses 2 minor roads.

Km.	Stations	Engineering works	Details and facilities
97.5	EICHENAU ..	..	Restricted goods facilities. Line crosses minor road.
98.1	FUCHHEIM ..	..	SER. Wb (40 t). Line crosses minor road at station. Line crosses minor road.
		2 bridges or culverts over streams.	Line crosses 3 minor roads.
102.1	AUBING ..	..	SER. Wb (30 t). Line crosses 2 minor roads.
*105.1	..	..	J (trailing) left with— (1) DT electrified line from Stuttgart (Route 82). J (trailing) right 4 track electrified from— (a) Herrshing (ST electric). (b) Gauting (DT electric). (c) Tutzing (DT electric). Line continues 8 track to München.
*105.7	MÜNCHEN-PASING	..	Electric sub-station. SER. Wb (40 t). Cr (5 t). Loco depot. Tbl (25 m.). W. RpS (Locos). For details of facilities and description of line to München, see Route 122.
*113.1	MÜNCHEN Hbf.	..	SER. Wb (30 t). Cr (25 t). MY (Laim). MY (Ost). RpS (Loco, C & W). ES (4 RH). ES (München Ost). For details of facilities at München see Routes 122 and 123 and illustrations, Plans 32-32v and photograph 11.

ROUTE 120

LINDAU HBF-KEMPTEN-BUCHLOE-AUGSBURG

General Description

This line is DT and s.o. throughout and forms part of the main line from Zürich (Switzerland) to Augsburg and Nürnberg. The gradient is principally a rising one to Günzach and there are many sharp curves on this part of the line. From Oberstauffen to Immenstadt the course of the R. Ach and the shores of the Alp See are followed.

From Günzach to Augsburg the gradient is principally a falling one. At Kaufbeuren the R. Wertach is crossed and the line follows the valley of the river to Augsburg. At Kempten the R. Iller is crossed.

Principal junctions are at Lindau, with the ST s.o. line from Friedrichshafen and with the ST line from Feldkirch and Innsbruck (s.o. from Bregenz and electrified from Bregenz to Innsbruck). Kempten J for the ST s.o. line from Neu Ulm. Buchloe J for DT s.o. line to München and for ST s.o. line from Memmingen. Augsburg for the DT electrified line from Stuttgart to München, the DT electrified line from Donauwörth, and the ST s.o. line from Landshut.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 191.8 km. (119½ miles).
3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT:
Lindau-Buchloe, 12½ per mille (1 in 80).
Buchloe-Augsburg, 8 per mille (1 in 120).
6. MINIMUM RADIUS OF CURVES:
Lindau-Buchloe, 292 m.
Buchloe-Augsburg, 510 m.
7. TRACTION: Steam.
8. MAXIMUM DISTANCE BETWEEN STATIONS:
9.9 km. (6¼ miles) between Wildpoldsried (9.9 km.) and Günzach (10.2 km.).
9. EXISTING SITES:
Lindau. Kempten. Augsburg.

RAILWAYS

10. MARSHALLING FACILITIES: Augsburg.

11. WATERING FACILITIES:

Lindau. Kempten. Augsburg.

12. VULNERABLE PORTS: Marked with asterisk in text.

(a) Marshalling and locomotive facilities referred to in 9 and 10 above.

(b) Junctions at Lindau (1.2, 1.5 and 2.3 km.), Hergatz (24.0 km.), Kempten (88.4,

99.9 and 91.2 km.), Kaufbeuren (133.7 km.), Buchloe (152.1 and 153.7 km.), and Augsburg (171.1 km.).

(c) Bridge over R. Ach at 54.0 km., and R. Iller at 92.8 km.

13. CAPACITY:

Trains per day
each way
48Net train load tons
military stores
310-410

Distance from Lindau

Km.	Stations	Engineering works	Details and facilities
0	LINDAU Hbf		<p>Passenger Station: 4 island platforms c. 300 m. long.</p> <p>Carriage Sidings: SW of passenger station. 12 DES, c. 21.5 m. long, with connections to loco depot.</p> <p>Loco Depot: W of passenger station.</p> <p>ES RH, stabling capacity c. 25 locos. Tbl (27 m.). W. Served by 12 LS (each 225 m.) from carriage sidings.</p> <p>Goods Yard: NE of passenger station. c. 5 DES each 160 m. Wb (40 t).</p> <p>Storage Sidings: NW of passenger station. c. 8 LS each 225 m. long.</p> <p>(From Lindau Hbf to Bregenz, German-Austrian loading gauge is permissible only to a height of 4,500 mm. for hay, straw, and other easily inflammable goods.)</p> <p>At Lindau inter-connection with Bodensee (Lake Konstanz) steamship service.</p> <p>Junction for ST s.o. line from Friedrichshafen for ST line from Feldkirch and Innsbruck (steam from Lindau to Bregenz and electrified from Bregenz to Innsbruck).</p>
0.7	..	Causeway over Bodensee.	c. 550 m. long.
*1.2	..	..	Line reaches mainland.
*1.5	..	..	J (facing) right, with ST s.o. line to Bregenz (Route 121).
			J (trailing) right, with connection from Bregenz line.
			Line crosses minor road.
1.7	LINDAU-ANSGLACH	..	Passenger station.
*2.3	..	..	J (facing) left, with ST s.o. line to Friedrichshafen (21.8 km.).
			Line crosses main road.
4.0	BODOLZ	..	Passenger station.
			Line crosses minor road.
			Line curves sharply right.
			Line crosses minor road.
5.3	LINDAU-SCHONAU	..	Passenger station.
			Line crosses 3 minor roads.
8.1	OBERREITENAU	..	SR. Wb (40 t). Cr (1.2 t).
			Line curves right.
8.9	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
			Line crosses main road.
12.0	REHLESEN		Passenger station.
			Line crosses main road.

Km.	Stations	Engineering works	Details and facilities
13.8	SCHLAATZ	..	SER. Wb (30 t). Cr. 1/28 t. Line crosses minor road at station. Line crosses 3 minor roads.
17.4 18.4	HERGENSWILER ..	.. ..	SER. Wb (30 t). Line crosses main road. Line crosses minor road.
23.1	HERGATZ	..	SER. Wb (30 t). Cr. Line crosses minor road. Line crosses main road.
24.0	..	..	J (facing) left with ST s.o. line to Knelegg (17.7 km.) on the Aulen- dorf-Memmingen line. Line crosses main road.
25.4	WOHRRECHTS	..	Passenger station. Line crosses 2 minor roads. Line curves sharply right.
26.7	MARIA THANN	..	Passenger station. Line crosses minor road.
27.7	..	Bridge or culvert over stream.	
29.3	OPPENACH	..	Passenger halt. Line crosses 2 minor roads at sta- tion. Line curves left. Line crosses main road.
31.7	BIESENBERG	..	Passenger station. Line crosses 2 minor roads.
33.8	HEIDENKIRCH	..	SER. Wb (30 t). Line crosses minor road. Line crosses main road. Line crosses minor road. Line curves right. Line crosses main road.
37.7	..	..	J (trailing) right with ST s.o. dead end line from Scheidegg (9.9 km.).
38.5	RÖTHENBACH (ALLOAU)	..	SER. Wb (30 t). Cr. (1.5 t). S of station J (facing) right, with ST s.o. dead end line to Weiler (5.7 km.). Line crosses minor road.
39.5	..	Bridge or culvert over stream.	
39.9	..	Ditto	Line curves left. Line crosses secondary road.
40.9	..	Bridge or culvert over stream (Tobel).	Line curves left. Line crosses minor road. Line curves right. Line curves left before station.
44.5	HARBATSHOFEN	..	Line curves right. Line crosses minor road.
45.3	..	Bridge or culvert over stream (Ager).	Line crosses minor road.
45.3	..	Bridge or culvert over stream.	Line crosses minor road.
45.4	..	..	Line crosses 2 minor roads. Line crosses main road. Line crosses 3 minor roads.

Km.	Stations	Engineering works	Details and facilities
51.6	OMBERTAUTEN	..	SER. Wb (40 t). Cr (1175 t). Line curves left.
54.0	..	Bridge over R. Ach.	Line follows valley of R. Ach and Alp See until the R. Ach flows into the R. Iller at Immenstadt. Line crosses main road.
56.3	THALKIRCHDORF	Bridge or culvert over stream.	SER. Wb (30 t). Line crosses main road.
		Ditto	Line crosses main road. Line crosses 3 minor roads.
61.2	RATHOLZ	..	Passenger station. Line runs beside the Alp See for c. 4 km.
65.6	..	..	Line curves right and runs along E end of the Alp See. Line crosses minor road.
67.2	..	Bridge or culvert over stream.	Line crosses road.
68.4	IMMENSTADT	..	SER. Wb (40 t). Cr (115 t). Line crosses several roads in Im- menstadt.
69.0	..	Ditto	J. (facing) right, with ST a.o. dead end line to Sonthofen (7.5 km.) and Oberstdorf (20.9 km.). Line crosses main road.
69.2	..	..	Line runs in valley of R. Iller.
70.0	..	Ditto	
71.9	..	Ditto	
72.6	..	Ditto	
74.2	SEIFEN (SCHWAB)	..	SER. Wb (30 t).
74.6	..	Bridge or culvert over stream (Walters).	
75.6	..	Ditto	Line crosses main road.
76.3	..	Bridge or culvert over stream.	Line crosses minor road.
78.6	OBERDORF (IMMENSTADT)	..	SER. Wb (30 t). Line crosses minor road.
82.2	..	..	Line crosses main road. Line crosses minor road.
83.6	WALTENHOFEN	..	SER. Wb (30 t).
84.2	..	Bridge or culvert over stream (See).	Line crosses minor road.
85.5	KEMPTEN-HEGGE	..	Restricted goods facilities. J (trailing) right, with short DE spur. Line crosses minor road.
88.4	..	..	J (facing) left, with line avoiding Kempten station and going to Buchloe (DT) and Neu Ulm (R. 118).
89.4	..	Fly-over.	Line passes over or under, avoiding line mentioned above.
90.0	KEMPTEN (ALLGÄU) HSE.	..	SER. Wb (40 t), Cr (10 t). Line from: 2 ES, RH, one with holding capacity 20, the other capacity 17. 2 LM 20 mN. Workshops attached. W. & P. 111. Line crosses out of Kempten sta- tion along the main line to O.N.B.

Km.	Stations	Engineering works	Details and facilities
90.4	J (facing) right, with ST s.o. line to Silbertshausen (27.9 km.); also J (facing) right, with LT s.o. line to Lindau.
90.8	..	Bridge over R. Iller.	Total length 152 m. Height 36 m. 1 main span of 63.8 m.; also 2 x 22.3 m. concrete three-hinged arches. Quadruple track.
90.9	J (trailing) right, with DT s.o. line from Lindau which avoids Kempten station.
91.0	J (facing) right, with ST s.o. line to Pfaffen-Steinach (33.0 km.), thence to Partenkirchen on Route 122.
91.2	Line crosses road and runs NE. J (facing) left, with ST s.o. line to Neu Ulm (Route 118). Line crosses minor road.
92.7	..	Bridge or culvert over stream.	Line crosses minor road.
94.2	..	Ditto	
94.9	..	Ditto	
95.5	..	Ditto	Line crosses minor road.
96.2	BETZIGAU	..	SER. Wb (30 t). Line crosses minor road.
96.4	..	Bridge or culvert over stream (Kohter).	
97.9	..	Bridge or culvert over stream.	
98.6	..	Ditto	
98.9	..	Ditto	
99.3	WILDPOLDSEED	..	SER. Wb (30 t). Line crosses minor road.
100.2	..	Ditto	Line crosses minor roads.
103.1	..	Ditto	
103.3	..	Ditto	Line crosses 3 minor roads and curves sharply right. Line crosses 2 minor roads.
109.2	GÜNZACH	..	SER. Wb (40 t). Line crosses secondary road and minor road. Line curves right.
113.1	..	Ditto	
113.5	..	Ditto	Line curves left. Line crosses 2 minor roads and curves sharply right. Line crosses secondary and minor road.
118.9	AITRANG	..	SER. Wb (40 t). Line crosses minor road at station.
119.6	..	Ditto	Line crosses minor road.
123.4	RUDERSHOFEN	..	SR. Wb (30 t). Line crosses 3 minor roads.
123.5	J (trailing) right, with ST s.o. dead-end line from Füssen (35.3 km.) and Lechbruck (27 km.). Axle load from Markt Oberdorf to Seeg 16 t, from Ebersmatten to Füssen 14 t, and from Steinbach (Allgäu) to Lechbruck 12.5 t.

Km.	Stations	Engineering works	Details and facilities
127.3	BIRMENWIRZEN	..	SER. Wb (30 t). Line curves left and runs N in the valley of R. Wertach. Line crosses 2 minor roads and a main road. Line crosses 2 minor roads.
132.7	KAUFBEUREN	..	SER. Wb (40 t). Cr (10 t). Line crosses minor road.
133.3	..	Bridge over R. Wertach.	J (facing) right, with ST s.o. line to Schongau (21.1 km.), and Weilheim (53.9 km.), on the München-Innsbruck electrified line (Route 112). Line crosses minor road and main road. Line crosses 3 minor roads.
*133.7	..	..	..
137.8	LEINAU	..	SR. Wb (30 t). Line crosses 6 minor roads.
140.8	PFORZEN	..	SER. Wb (40 t). Line crosses numerous minor roads.
146.0	BECHSTETTEN	..	SER. Wb (30 t). Line crosses minor road at station. Line crosses 3 minor roads.
148.5	..	Bridge or culvert over stream (Hunger).	Line crosses 3 minor roads.
*152.1	..	..	J (trailing) left, with ST s.o. line from Memmingen (Route 119).
152.9	BUCHLOE	..	SER. Wb (40 t). Cr (0.5 t). Line crosses road.
*153.7	..	..	J (facing) right, with DT s.o. line to München (Route 119).
154.0	..	Bridge or culvert over stream.	Line crosses minor road.
155.9	..	Ditto	Line crosses minor road.
158.7	..	Bridge over R. Gennach.	..
159.1	..	Bridge or culvert over stream.	Line crosses minor road.
159.8	LAMERDINGEN	..	Restricted goods facilities. Restricted cattle facilities.
160.3	..	Ditto	Line crosses 4 minor roads.
163.3	WESTERRINGEN	..	SER. Wb (40 t). Line crosses minor road.
*166.1	..	Bridges over R. Singold and tributary.	Carrying main road.
166.4	..	..	Line crosses 3 minor roads.
166.5	..	Road overbridge.	..
168.8	SCHWARMUNGEN	..	SER. Wb (40 t). Line crosses numerous minor roads.
171.8	MITTELSTETTEN	..	Passenger halt.
174.1	GROßMATINGEN	..	SER. Wb (40 t). Line crosses 2 minor roads.
176.2	WEHRINGEN	..	Passenger halt. Line crosses 4 minor roads.
176.2	..	..	J (trailing) right, with ST s.o. line from Kaufbeuren (22 km.) on the DT s.o. Buchloe-München line (Route 119). Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
179.8	BREMEN	..	SER. Wb (40 t). Line crosses numerous minor roads.
185.3	INNEN	..	SER. Wb (70 t). Line crosses 4 minor roads.
188.5	GÖÖNINGEN	..	Passenger halt. Line crosses minor road.
189.4	..	Fly-over.	Line passes over or under factory siding.
189.5	..	..	Trailing connection right, with loop from above factory siding.
190.5	MORELLSTRASSE	..	Passenger halt. Trailing connections left with siding from factories.
*191.1	..	..	J (trailing) right, with electrified Stuttgart-München line (Route 82).
Road overbridge.			
*191.8	AUGSBURG HST.	..	SER. Wb (40 t); Cr (15 t). MT: Capacity 2,300 wagons per 24 hours. Loco Depot: 2 ES (RH type); total capacity 60. 2 Tbl. (6. 25 m). W. RPS (carriage and wagon). For details of Augsburg, see Route 82. J for Route 82, 85, 88, to Stuttgart, Treuchtlingen, and Ingolstadt. Line continues to Stuttgart and Karlsruhe as Route 82.

ROUTE 121 LINDAU-INNSBRUCK

General Description

The line leaves the island on which Lindau is situated, crosses part of the Bodensee (Lake Konstanz) by a causeway and after reaching the mainland keeps close to the shore until reaching Bregenz. It then runs S through the wide Rhine valley, intersected by many streams, to Feldkirch. Here it turns SE to follow the narrower valley of the R. Ill, with rising gradients, to Bludenz. At Bludenz it leaves the R. Ill and follows the valleys of the Alfenz, Rosanna and Senna to Landeck, where the broader valley of the R. Inn, with easier gradients, is joined and followed to Innsbruck. Severe gradients, sharp curves, numerous bridges and several tunnels—including the famous Arlberg Tunnel—are met with in the Bludenz-Landeck section. The line crosses the 700 m. contour-line just after entering the Alfenz valley, passes under the 1,800 m. contour level in the Arlberg tunnel and descends to river level at Landeck.

Apart from the causeway over the Bodensee (6,350 m. long) the main bridges are (i) over Bregenzer Ach at 13.2 km., (ii) over R. Ill, at 40.3 km., (iii) over R. Ill, at 60.7 km., (iv) over Trübsen Gorge, at 123.7 km., (v) over R. Inn, at 130.7 km., and (vi) over Obere Ache, at 130.7 km.

There are tunnels at 41.5 km., 42.5 km., 43.5 km., at 70.3 km., 71.0 km., 72.0 km., 73.0 km., at 107.3 km., 108.0 km., 109.0 km., and at 114.3 km. (both 1,000 m. long), and at 130.7 km. (Arlberg, 1,000 m. long).

Main junctions are at 1.2 km. (J with Route 120), at 11.1 km. (J with Bregenzerbahn, length 35.3 km.), at 13.6 km. (J with ST s.o. line to St. Margrethen and Switzerland), at 45.5 km. (J with ST electrified line to Swiss frontier and St. Gallen), at 202.3 km. (J with Route 122), and at 203.8 km. (J with Route 123a).

The line is ST throughout, being s.o. from Lindau to Bregenz, and electrified from Bregenz to Innsbruck. Sub-stations are at Feldkirch, Flirsch, Roppen and Zirl.

General Details

1. GAUGE: 1,435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 204.4 km. (126½ miles).
3. TRACK: Single.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
Lindau-Bregenz, 20 metric tons.
Bregenz-Innsbruck Hbf, 13 metric tons.
5. MAXIMUM GRADIENT: No details, but will be severe after leaving Feldkirch. The ruling gradient between Bludenz and Langen is 31 per mille.
6. MINIMUM RADIUS OF CURVE: 250 m.
7. LOCATION:
Lindau-Bregenz, 20 km.
Bregenz-Innsbruck Hbf, 13 km.
Innsbruck, 13 km.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

On Lindau-Bregenz section, 2.8 km.

On Bregenz-Innsbruck section, 9.9 km. (excluding Arlberg Tunnel where track is double)

9. ENGINE SHEDS:

Lindau.	Bregenz.	Landeck.
Bludenz.	Innsbruck.	

10. MARSHALLING FACILITIES: Lindau. Innsbruck.

11. WATERING FACILITIES:

Lindau.	Dannofen.	Pians
Bludenz.	Langen.	Landeck.
Bratz.	St. Anton.	Imst.
Hintergasse.	Flirsch.	Sils.
Dalass.	St. Rengen.	Zirl.
		Innsbruck.

12. VULNERABLE POINTS: Marked with asterisk in text.

(a) Locomotive and marshalling facilities given in 9 and 10 above.

(b) Repair shops at Innsbruck W and Bludenz.

(c) Sub-stations at Feldkirch (47.0 km.), Dannofen (89.0 km.), Flirsch (116.8 km.), Reppen (154.0 km.), and Zirl (189.9 km.).

(d) Bridges at 13.2, 49.5, 60.7, 123.7, 130.7 and 156.7 km.

(e) Tunnels at 47.7, 76.7, 80.1, 80.7, 81.6, 82.1, and 93.7 km. (Arlberg).

(f) Junctions at 1.2, 45.5, 202.3 and 203.8 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
With electric traction	12-16	300
With steam traction	10-12	250

Distances from Lindau

Km.	Stations	Engineering works	Details and facilities
0.0	LINDAU Hbf (BODENSEE)		<p>Passenger Station: 4 island platforms 300 m. long.</p> <p>Loco Depot: W of passenger station. ES, 1 RH (depth 27 m.), stabling capacity c. 25, Tbl (27 m.), W., served by 2 LS (each 225 m.) from carriage sidings.</p> <p>Carriage Siding: SW of passenger station, 12 DES each 250 m. long, connection to loco depot.</p> <p>Goods Yard: NE of passenger station, c. 5 DES each 160 m. long. Wb (40 t).</p> <p>Storage Siding: NW of passenger station, c. 8 LS each 225 m. long. (From Lindau Hbf to Bregenz, German-Austrian loading-gauge is permissible only to height of 4,500 mm. for hay, straw, and other easily inflammable goods.)</p> <p>At Lindau, inter-connection with Bodensee (Lake Konstanz) steamship services.</p> <p>Line starts on island and runs N. c. 550 m. long.</p> <p>Line reaches mainland and curves NE.</p> <p>J (triangular) with DT s.o. Lindau-Kempten-Augsburg line (Route 120).</p>
0.7	..	Causeway over Bodensee.	
1.2	
1.6	LANGENWEG		Passenger halt.
2.1	..	Bridge or culvert over stream.	
2.2	..	Bridge over main road.	
2.3	J (facing) left with avoiding line past station.
2.6	LINDAU-REUTEN		SER. Wb. (60 t). Gr (10 t).
3.6	..	Road overbridge.	Line crosses road.
4.2	..	Bridge over main road.	
5.2	
5.4	LINDAU-SCHAFHÖRNER		Passenger halt.
5.4	..	Bridge or culvert over stream.	Line crosses former Austro-German frontier.
5.5	..	Bridge or culvert over stream.	
5.7	
5.8	
5.9	
6.0	
6.1	
6.2	
6.3	
6.4	
6.5	
6.6	
6.7	
6.8	
6.9	
7.0	
7.1	
7.2	
7.3	
7.4	
7.5	
7.6	
7.7	
7.8	
7.9	
8.0	
8.1	
8.2	
8.3	
8.4	
8.5	
8.6	
8.7	
8.8	
8.9	
9.0	
9.1	
9.2	
9.3	
9.4	
9.5	
9.6	
9.7	
9.8	
9.9	
10.0	

Km.	Stations	Engineering works	Details and facilities
6.7	HATHUM ..	..	Passenger halt.
7.7	LANGER STRIN	..	Passenger halt.
8.7	TANNENBACH	..	Passenger halt.
9.7	BREGENZ HAVEN	..	Passenger halt.
10.2	BREGENZ ..	..	ES. SER. Wb (30 t). Cr (15 t). Connection with Bodensee (Lake Konstanz) steamship services. I with Bregenzer-Waldbahn to Bregau (distance 35.3 km.) Gauge 0-76 m.). Aerial cable way to Pfander. Distance 2,075 m. Height 1,064 m. Beginning of electrified section. Line crosses 500 m. contour-line.
11.2	..	..	..
12.3	..	Bridge over main road.	..
13.2	..	Bridge over Bregenzer Ach.	c. 100 m. long.
13.4	RIEDENBURG (VORARLBERG)	..	Passenger halt.
13.6	..	..	J (triangular) with ST a.o. line to St. Margrethen and Switzerland. On this route the German- Austrian loading gauge is limited to a height of 4,900 mm. for hay, straw and other easily inflam- mable goods. Distance to St. Margrethen 12.7 km.
14.4	LAUTERACH (VORARLBERG)	..	SR.
15.9	..	..	Line crosses main arterial road.
16.3	..	Bridge or culvert over stream.	..
17.9	..	Ditto	..
18.3	..	Ditto	..
18.7	SCHWARZACH (VORARLBERG)	..	SR.
20.1	..	Bridge over tributary of Dornbirner Ach.	..
20.3	HASELSTAUDEN	..	Passenger halt.
21.1	..	Ditto	Line proceeds on a slightly rising gradient.
22.3	DORNBIEN ..	..	SER., Wb (30 t). Cr (10 t).
23.1	..	Bridge over river.	..
23.2	HATLERDORF	..	Passenger halt.
26.4	..	Bridge over stream (Seelacke).	Line proceeds on a falling gradient.
28.1	..	Bridge over stream (Ermen).	..
29.3	..	Bridge over stream (Ems).	..
30.2	HOHENEMS	..	SER. Wb (30 t). Falling gradient.
32.3	ALTACH-BAUKEN	..	Passenger halt. Rising gradient.
34.8	GÖTZ ..	..	SR. Wb (35 t).
35.3	..	Bridge over stream (Emme).	..
37.0	KLAUS-KUBLACH	..	Passenger halt.
38.0	..	Bridge over river.	..
39.0	..	Ditto	..
40.1	SEEL-ROTH ..	..	Passenger halt.
40.7	..	Bridge over R. Eutz.	..
41.0	RA. KÖSTL	..	SR. Wb (30 t). Line leaves valley of Rhine and enters hilly country.

Km.	Stations	Engineering works	Details and facilities
42.9 45.5	..	Bridge over R. Newla. ..	J (trailing) right, with ST electrified line from Buchs (St. Gallen). Distance to Puchs, 18.5 km. Swiss frontier station.
47.0	FELDKIRCH	..	SER. Wb (33 t). Cr (4 t). Sub-station.
47.7	..	Tunnel.	c. 800 m. long. Line curves SE after entering tunnel, to enter valley of the Ill. Radius of curve c. 250 m.
49.5	..	Bridge over R. Ill and tributary.	Line crosses to right bank of Ill.
51.4 53.9	FRASTANZ	.. Bridge over R. Gallina.	SR.
56.4	SCHLINS	..	Passenger halt.
57.8 58.8 60.5 60.7	NENZING	.. Bridge over R. Meng. Bridge over R. Ill.	SR. Line turns E to cross R. Ill.
63.4	LUDWIG-THÜRINGEN	..	SR.
65.3 65.8	NÜZIDERS	.. ..	SR. Line turns SSW to run close along left bank of R. Ill.
66.6 67.1	..	.. Bridge over river.	Line crosses Road 31.
67.8	BLUDENZ	..	RpS for repair and maintenance of electric locos. ES running shed for electric locos. SER. Wb (30 t). J for Montafoner Bahn, local electric railway to Schruns, length 12.8 km. Maximum permissible axle-load 11 t. Maximum wheelbase 4 m.
69.5	..	..	J (facing) right, with ST electric line to Schruns. Line turns sharply E, curve radius c. 300 m.
69.7	..	Bridge over tributary of R. Ill and roadway.	From this point the line leaves the valley of the Ill and follows the valley of its tributary, the Alfenz. The valley narrows considerably, with steep hills on each side, and heavy gradients will be experienced.
71.4 72.2 73.5	BINGOS	.. .. ..	Passenger halt. Line crosses main road. Line crosses main road.
74.6 75.2	BRAZ	.. Bridge over tributary.	SR. PL (440 m.). W.
75.9 76.6 76.7 77.0 78.1	..	.. Ditto Ditto Tunnel. Tunnel. Bridge over stream.	Line curves N and then S, radius 250 m. 150 m. long. 120 m. long. 100 m. long.
78.9	HINTERKAS	..	Passenger station. PL (440 m.). W.
80.1	..	..	Line turns sharply E, curve radius c. 300 m.

Km.	Stations	Engineering works	Details and facilities
80.7	..	Tunnel.	125 m. long.
81.4	..	Bridge over river (Schönbühl- bach).	70 m. long.
81.6	..	Tunnel.	75 m. long.
82.1	..	Tunnel.	55 m. long.
82.5	..	Bridge over river.	3 spans x 25 m.
83.9	DALAAS	..	SR. Wb (20 t). W. PL (440 m.).
84.6	..	Bridge over Mühlstobel.	15 m.
85.7	..	Bridge over R. Radons- bach.	25 m.
87.0	..	Bridge over stream.	25 m.
87.3	..	Bridge over Glöngstobel.	15 m.
88.0	WALD (ARLBERG)	..	PL (440 m.). W.
88.2	DANNOFEN	..	Electric sub-station.
91.0	..	Bridge over stream.	50 m.
91.1	KLOSTERLE (ALPENZ)	..	Passenger halt.
92.7	..	..	Line crosses Road 31.
93.4	LANGEN (ARLBERG)	..	SER. PL (449 m.). W.
93.5	..	Bridge over R. Alfenz.	20 m.
93.7	..	Tunnel (Arlberg).	10,250 m. long. DT. Tunnel runs straight until within 100 m. of eastern exit, when it curves NNE. Tunnel runs under mountains (1,800 m. contour-line) and main road.
104.2	..	(?) Bridge over main road and stream.	
104.3	ST. ANTON (ARLBERG)	..	SR. PL 488 m. W.
105.4	..	Bridge over R. Rosanna.	25 m.
106.2	..	..	Line curves sharply N. Curve radius c. 200 m.
106.3	..	..	Line re-crosses main road.
106.4	..	Bridge over R. Rosanna.	Length of bridge 21.7 m. Line curves sharply E. Curve radius c. 200 m.
107.8	ST. JAKOB (ARLBERG)	..	Passenger halt.
107.9	..	..	Line re-crosses main road.
109.4	..	Bridge over R. Vadiesen.	
110.6	PETTERU	..	SR. PL (440 m.).
112.5	..	Bridge over R. Rosanna.	36 m.
112.8	..	Bridge over tributary.	
113.9	SCHNANN	..	Passenger halt. Restricted goods facilities.
116.1	..	Bridge over R. Rosanna.	36 m.
116.2	..	Bridge over stream (Gries).	
116.7	..	Bridge over R. Rosanna.	24 m.
116.8	FELDEN	..	SR. PL (440 m.). Sub-station.
113.4	..	Bridge over stream (Ober Klaus).	
114.3	..	Bridge over stream (Unter Klaus).	
121.0	STAINEN	Tunnel.	35 m.
121.3	..	..	30 m.
121.4	..	..	30 m.
121.5	..	..	30 m.

Km.	Stations	Engineering works	Details and facilities
			Masonry approach arches and piers. Underside of original span 86 m. above river.
124.1	WITZBERG	..	Passenger halt.
126.1 130.2	PIANS	Viaduct (4 spans \times 20 m.).	SR. PL (440 m.). W. Line curves sharply N and then NE. Curve radius c. 200 m.
130.3 130.4 *130.7	LANDAU-PELFUCHS	.. .. Bridge over R. Inn.	Passenger halt. Line crosses minor road. 50 m.
*132.0	LANDAU (TIGEL)	..	ES. SER. Wb (30 t). Cr (4 t). PL (755 m.). W. Line follows valley of R. Inn for rest of journey. Line crosses minor road.
133.4	..	..	..
133.6 134.4	ZAMM	.. ..	Passenger halt. Line curves NE, running close beside river to Schönwies.
135.7 135.9 136.8 137.3	..	Bridge over stream. Ditto Ditto ..	.. .. .. Line sharply curves E. Curve radius c. 200 m.
138.3	..	Bridge over stream (Kronburger).	..
141.1	SCHÖNWIES	..	SR. PL (500 m). Line turns away from river.
142.2	..	..	Line curves E, and rejoins river, keeping close to it as far as Roppen.
142.5 142.7 142.9	..	Bridge over stream. Ditto Ditto	......
145.0	IMSTADBERG	..	Passenger halt. Restricted goods facilities.
145.3 145.9 147.2 149.1	..	Ditto Ditto Ditto ..	.. .. .. Line crosses minor road.
149.4 150.9 151.7 152.7	IMST	.. Bridge over stream (Pitz). Bridge over stream (Walder). Bridge over stream (Waldele).	SER. Wb (25 t). PL (570 m.). W.
*154.0 154.1	ROPPEH	.. Bridge over stream (Leonhard).	Halt. SR. Sub-station.
*156.7	..	Bridge over R. Otzthaler Ache.	80 m.
158.3	OTZTAL	..	SER. Wb (33 t). PL (500 m.). Line turns away from river.
161.6 161.9 162.8	HUMING	.. .. ..	Passenger halt. Line crosses main road. Line curves NE and rejoins river for short distance. From this point, line follows an easier course along the widening valley of the Inn.
163.3	SILZ	..	SR. Wb (25 t). PL (500 m.). W. Line runs beside main road to Pfaffenhofen.

Km.	Stations	Engineering works	Details and facilities
167.5 168.7	MOTL ..	Bridge over tributary.	Passenger halt.
169.4 172.8	STAM ..	Bridge over tributary (Bietzler).	SR.
173.0	RIETZ ..	..	Passenger halt. Restricted goods facilities.
175.4 176.9	.. ..	Bridge over tributary (Klaus). Bridge over tributary (Kanzing).	..
177.0 180.1	TEUFELSTANNHOFEN ..	Bridge over tributary (Kanzing).	SR. Wb (25 t). PL (500 m.). W.
182.7 184.2	FLAURLING ..	Bridge over tributary.	SR. PL (440 m.).
184.9 186.0	HATTING ..	..	Passenger halt. Restricted goods facilities.
187.2	INZING ..	..	Passenger halt. Restricted goods facilities.
188.6 189.6	.. ..	Bridge over tributary. Bridge over stream.	..
*189.9	ZIRL ..	..	SR. PL (500 m.). W. Sub-station.
190.7 192.0	.. ..	Bridge over tributary (Mühl). Bridge over tributary (Senders).	..
192.1	UNTERPERFL ..	..	Passenger halt. Restricted goods facilities.
192.6	.. ..	Bridge over tributary (Meldach).	..
193.7 194.1 196.7 197.1	KEMATEN (TIROL) .. .. .. .. .. .. ..	.. .. Bridge over stream. Ditto Bridge over stream (Giessen).	SR. PL (200 m.).
197.2 197.3	VÖLS ..	Bridge over tributary (Seebauer).	PL (500 m.).
199.5 202.3	.. ..	Bridge over tributary.	J (trailing left, with ST electrified line from Partenkirchen (Route 122).
*202.8	INNSBRUCK WEST ..	..	Passenger Station: 3 through platforms roads. Storage or Carriage Sidings: S of station. 9 LS c. 600 m. long. Goods Station: N of passenger station. SER. Wb (30 t). 2 DES, c. 260 m. long. Shed 30 x 10 m. Transformer Station: Large transformer station SE of passenger station. RAS: Wagons and electric locomotives, W of station, S of line, 2 sheds 70 x 40 m. and several smaller ones, served by 2 LS and 10 DES with access from E. of various lengths. 101.14 m.

Km.	Stations	Engineering works	Details and facilities
203.6 203.8	..	Bridge over stream.	Normal capacity 72 electric locos, and light and heavy repairs to 1,500 carriages and 3,000 wagons annually. No. of staff in 1935, 321. Locomotive erecting and repair shops, turning shop, smithy, welding shop, coppermiths' shop, paint shop, etc.
204.1	INNSBRUCK (Hbf.)	..	J (trailing) right, with DT electrified line from Brenner (Route 123a). Passenger Station: 5 through platform roads. 5 bay platform roads at S end and 2 at N end, 150-220 m. long. 4 LS on E side, c. 500 m. Loco Depot: adjacent to and S of passenger station, 2 ES, RH type, with 2 Tbl 21 and 17 m. diameter. W. 3 or 4 roads for coaling. Goods Depot: E of and adjacent to passenger station. SER. Wb (36 t). Cr (20 t). c. 9 DES 100-300 m. long, serving sheds c. 80 x 20 m., and 120 x 20 m. Marshalling Yard: E of passenger station. At least 16 LS average length 650 m. with shunt spur at S end, c. 300 m. long, access from N. Transhipment shed 140 x 14 m. SR.

ROUTE 122

INNSBRUCK-PARTENKIRCHEN-WEILHEIM-MÜNCHEN

General Description

The line crosses to the left bank of the Inn soon after leaving Innsbruck, runs W, and climbs steadily from 600 m. to the Martinswand tunnel. Emerging from this, it climbs steeply to another tunnel (1,000 m. contour-level). From this second tunnel it continues climbing to Reith, where it turns N and follows a succession of small valleys to Mittenwald. Between Seefeld and Scharnitz, on this section, the line reaches the 1,300 m. contour-line, and then descends to 1,000 m. At Mittenwald the line swings W, following the wide Isar valley to Partenkirchen. Here it turns N, following the Louach valley to Murnau. From this point the line runs through more open country, passing the Staffel See and Wurm See en route. The main road is followed closely from Innsbruck to Murnau.

This line forms an alternative to the Innsbruck-Kufstein-Rosenheim route (Route 123). Track is single to Tutzing, and double from Tutzing to München. Line is electrified throughout.

Main junctions are at Innsbruck (J with DT electrified line from Brenner, Route 123a), Innsbruck W (J with Route 121), at 37.0 km. (J with ST electrified line to Reutte, whence ST co. line to Kempten, Routes 113 and 120), at 103.2 km. (J with ST co. line to Pörsching, whence ST co. connections to Routes 117 and 121, at 105.6 km. (J with R 121 119), at Garmisch (double line to München), at 138.2 km. (J with DT dead-end electrified line to RPS at

Neuaußing), at 150.2 km. (J with Routes 119 and 82), and at 156.0 km. (J with Route 123).

Main bridges are at 2.3 km. (over R. Inn), at 152.3 km. (fly-over), and at 154.7 km. (bridge over multiple tracks).

There are several tunnels in the Innsbruck-Reith section, the main ones being at 11.0 km. (Martinswand, c. 2.5 km. long), and at 15.1 km. (tunnel c. 1.5 km. long, built on a N-S curve).

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 158.0 km. (98 miles).
3. TRACK:
 - Innsbruck-Tutzing (113.4 km.), single.
 - Tutzing-München Hbf (49.6 km.), double.
4. MAXIMUM PERMISSIBLE AXLE LOAD:
 - Innsbruck Hbf-Innsbruck Wbf, 18 metric tons.
 - Innsbruck Wbf-Scharnitz, 14 metric tons.
 - Scharnitz-München Hbf, 20 metric tons.
5. MAXIMUM GRADIENT:
 - Frontier-München, 17.1 per mille (1 in 58).

6. MINIMUM RADIUS OF CURVES: 200 m.
7. TRACTION: Electric, 15,000 volts A.C., 16 cycles, single-phase.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 7.2 km. Uffing (22.7 km.)-Huglfing (55.9 km.).
9. ENGINE SHEDS:
Innsbruck München.
10. MARSHALLING FACILITIES:
Innsbruck München.
11. WATERING FACILITIES:
Innsbruck München.
12. VULNERABLE POINTS: Marked with asterisk in text.

- (a) Locomotive and marshalling facilities given in 10 and 11 above.
- (b) Junctions at 0.3, 1.3, 27.0, 103.2, 105.6, 148.7, 177.2 and 178.0 km.
- (c) Sub-stations at Murnau and München-Pasing.
- (d) Bridges at 2.3, 21.9, 38.9, 58.0 and 150.4 km.
- (e) Tunnels at 6.2, 11.0 and 15.1 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
With electric traction	12-16	300
With steam traction	10-12	300

Distance from Innsbruck

Km.	Stations	Engineering works	Details and facilities
0.0	INNSBRUCK Hbf.		<p>Passenger Station: 5 through platform roads. 5 bay platform roads at S end, and 2 at N end, 150-200 m. long. 4 LS on E side, c. 300 m. Loco Depot. Adjacent to and S of passenger station. 2 ES, RH type, one (holding capacity c. 21) for electric locos, with 2 Tbls 21 and 17 m. diameter. W. 3 or 4 roads for coaling. Goods Depot: E of and adjacent to passenger station. SER. Wb (36 t). Cr (20 t). c. 9 DES 100-300 m. long, serving sheds c. 80 x 20 m. and 120 x 20 m. Marshalling Yard: E of passenger station. At least 16 LS, average length 650 m., with shunt spur at S end, c. 300 m. long—access from N. Tranship shed 140 x 14 m. SR. J (facing) left, with DT electrified line from Brenner (Route 123a). Line turns SW.</p>
0.3	..	Bridge over stream.	
1.3	INNSBRUCK WEST		<p>Passenger Station: 3 through platform roads. Storage or Carriage Siding: S of station. 9 LS, c. 600 m. long. SAS: Wagons and electric locos. Goods Station: N of passenger station. SER. Wb (30 t). 2 DES c. 260 m. long. Shed 80 x 10 m. Transformer station. J (facing) left, with SF electrified and via line to Landau (Route 121).</p>
2.0	..		Line crosses road.
2.4	..		Line crosses road.
2.8	..	Bridge over R. Inn.	
3.0	..		Line crosses 2 roads.
4.2	HEITING		SR.
5.0	..	Bridge over R. Inn.	
5.5	..		Line crosses road and curves W.
6.2	..		Line crosses road and curves W.
11.0	..		
15.1	..		
15.6	..		
148.7	..		
177.2	..		
178.0	..		

RAILWAYS

Km.	Stations	Engineering work	Details and facilities
8.5 11.0	KRANENBURG	Tunnel (Martinswand).	Passenger halt. c. 2.5 km. long. Tunnel runs NW in straight section for c. 1.0 km. and then curves SW. Curve radius c. 200 m. On leaving tunnel, line curves W. Curve radius c. 200 m.
14.0	HOCHZIML	..	Restricted goods facilities. Line turns N, climbing to 1,000 m. c. 1.5 km. long.
*15.1	..	Tunnel.	Tunnel curves N and S. Curve radius c. 250 m.
16.8	..	..	Line curves NW and re-crosses 1,000 m. contour-line. From this point line gradually ascends to 1,300 m. contour-line above Seefeld, and descends to 1,000 m. line at Scharnitz.
18.0 19.0	LEITHEN (TIROL)	..	Passenger halt. Line crosses main road.
20.2 20.3 21.3 21.7	REITH (TIROL)	.. .. Bridge or culvert over stream. Bridge or culvert over stream (Mühl).	SR. Line crosses main road.
*21.9	..	Bridge over R. Nieder.	..
23.7 23.9 25.8	SEEFELD (TIROL)	.. .. ..	SR. Wb (30 t). Line crosses main road. Line touches 1,300 m. contour-line, and begins to descend.
30.5	GIESENBACH	Bridge over stream (Giesen).	Passenger halt.
32.5	..	..	Line curves N, and crosses 1,000 m. contour-line.
33.4	..	Bridge over stream (Gleiersch).	..
33.7 34.6	SCHARNITZ	.. ..	SR. Wb (30 t). Line crosses former Austro-German boundary and curves NNW, running alongside main road to Mittenwald.
*38.9	..	Bridge over R. Isar.	..
39.5 42.6 45.5 45.6	MITTENWALD	Road overbridge. Road overbridge. Bridge over tributary of Isar.	SER. Wb (40 t).
45.8 46.2 49.4	KLAU	Road overbridge. Bridge over stream (Gulle).	Wb (30 t).
50.7 51.8	KALTENBRUNN OBERMAYR	.. Bridge over R. Kanker.	Wb (30 t).
53.6 55.8 *57.0	KALTENBRUNN	Bridge over R. Kanker.	Passenger station. J (trailing) left, with SF electrified line from Reutte, distance 30.4 km. (From Giesen to Reutte height of Austro-German loading gauge limited to 3,400 m. for easily maintainable goods. Maximum overload 15 t; except from Seefeld to Fiemmes, inclusive, 18 t.)

Km.	Stations	Engineering works	Details and facilities
			At Reutte, J with ST s.o. line to Pfonsen-Swinach (distance 13.7 km.), and thence to Kempten (Route 118 and 120).
57.4	GARMISCH-PARTENKIRCHEN	..	SER. Wb (30 t).
			I with 1 metre-gauge line to Grainau; thence rack and pinion and cable railways to Zugspitze. (See Section 15, Mountain Railways.)
58.0	..	Bridge over R. Kanker.	
59.6	..	Bridge over R. Loisach.	
60.9	..	..	Line crosses main road.
62.2	FARCHANT	..	SR. Wb (30 t).
62.7	..	..	Line curves NE, and runs alongside main road to Eschenlohe.
64.3	..	Bridge over stream (Ronets)	
66.1	OBERAU	..	SER. Wb (40 t).
66.8	..	Bridge over stream.	
71.6	..	..	Line crosses main road.
72.5	ESCHENLOHE	..	SER. Wb (30 t).
			I with light railway running SE along marsh, c. 2.2 km. long.
73.1	..	Bridge over R. Loisach.	
75.4	..	Bridge over tributary of R. Loisach.	
76.9	ONLSTADT	..	SER. Wb (30 t).
77.5	..	..	Line crosses road
77.7	..	Bridge over tributary of R. Loisach.	
78.2	..	..	Line crosses marsh.
78.5	..	Bridge over stream.	
78.8	..	Ditto	
79.0	..	Bridge over stream (Wohr).	
79.6	..	Ditto	Line leaves marsh.
79.9	..	Bridge over stream (Weidmoos).	
80.1	HECHENDORF	..	SR.
81.8	..	..	Line crosses main road.
82.6	..	..	J (trailing) left, with ST dead-end electrified line to Oberammergau (distance 23.7 km.; maximum axle-load from Seeleiten Berggeist to Oberammergau 13 t).
82.7	..	..	Line crosses main road.
83.1	MURNAU	..	SER. Wb (40 t).
			Line runs near Staffel See (inland lake) to Uffing.
83.5	..	..	Line crosses road.
83.8	..	..	Line crosses road.
86.6	..	..	Line crosses road.
87.4	..	..	Line crosses road.
88.4	..	..	Line crosses main road.
88.7	UFFING	..	SER. Wb (30 t).
89.2	..	..	Line crosses road.
89.4	..	Bridge over stream.	
91.2	..	..	Line crosses road.
91.8	..	..	Line crosses 625 m. contour-line.
94.3	..	Bridge over stream (Hunger).	
95.1	..	..	Line crosses main road
97.9	HUGLFING	..	SER. Wb (40 t).
98.5	..	..	Line crosses main road.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
107.7	POLLING	..	SER. Wb (30 t). Line crosses road.
101.9	..	Bridge over tributary of R. Ammer.	J (trailing) left, with ST electrified line to Peissenberg (distance 8.9 km.).
101.9	..	..	From Peissenberg, ST s.o. line to Schongau and Kaufbeuren (Route 120, distance 45.0 km.).
*103.2	..	..	From Schongau, ST s.o. line to Kaufering (Route 119, distance 33.5 km.) and Bobingen (Route 120, distance 56.1 km.).
104.5	WEILHEIM (OBERBAY)	..	SER. Wb (40 t). Cr (1.5 t). J (facing) left with ST s.o. line to Geltendorf (Route 119, distance 33.3 km.) and Mering (on Route 82).
*105.6	..	..	Line crosses main road.
106.1	..	Bridge over stream.	
106.9	..	Bridge over stream (Hard).	
108.4	..	..	SER. Wb (30 t).
109.1	WILHEIMSFELD	..	
109.6	..	Bridge over stream (Grun).	
110.8	..	Bridge over stream (Windach).	Line crosses 600 m. contour-line.
111.4	..	Bridge over stream.	
113.0	..	Ditto	
113.9	..	..
114.4	DELMENDORF	..	Wb (30 t). J (trailing) right, with ST dead-end electrified line from Kochel (distance 35.3 km.).
115.6	..	..
116.2	..	Ditto	Line curves N. and runs beside Wurm See to Starnberg.
116.6	..	..
117.0	..	Ditto	
117.5	..	Ditto	
118.3	..	Ditto	SER. Wb (40 t). DT begins.
118.4	..	..
119.8	..	Bridge over stream.	
120.5	..	Ditto	Line crosses road.
121.0	..	..
123.1	..	Road overbridge.	
123.2	FELDAJING	..	SER. Wb (30 t).
123.3	..	Bridge over stream (Stanzer).	
125.3	POMENHOFEN	..	SER. Wb (30 t). Line crosses road.
125.7	..	..
128.1	..	Road overbridge.	
130.1	STARNBERG	..	SER. Wb (40 t). Line crosses main road.
130.6	..	..	Line crosses road.
130.9	..	..	Line crosses road.
131.2	..	..
133.5	..	Road overbridge.	
134.5	MUETHAL (OBERBAY)	..	SER. Wb (30 t).
139.1	GAUTING	..	SER. Wb (30 t). J with DT electrified line to Muenchen. Line continues 4-track to Muenchen-Pasing.
140.6	..	..	Line crosses 375 m. contour-line.
141.0	PLANING	..	SER. Wb (40 t). Line crosses 430 m. contour-line.
143.1	..	..
143.5	..	..

Km.	Stations	Engineering works	Details and facilities
*147.7	J (trailing) left, with DT DR electrified line to Herrsching, on Ammer See (distance 209 km.). ST after Neuaußing. RPS at Neuaußing (passenger stock). Line crosses main road. Line crosses 525 m. contour-line.
148.9	J (trailing) left, with—
149.7	(1) DT 120 m. line from Buchloe (Route 119).
*150.2	..	Fly-over.	(2) DT electrified line from Augsburg (Route 82). Line continues 2-track to München.
*150.4	..	Bridge over R. Wurm.	
*150.6	MÜNCHEN-PÄRHO	..	Electric sub-station. Passenger Station: 4 platforms (3 island) c. 300-500 m. 6 through tracks. Goods Yard: S of line. SER. Wb (40 t). Cr (5 t). 5 DES c. 25 m. long with road access. 4 DES c. 340 m. long serving goods shed. Marshalling Yard: N of line, capacity 2,000 wagons per 24 hours; comprises 2 separate yards. (1) With approaches at W end from Stuttgart line (Route 82), and E end from Innsbruck line (Route 123). 8 LS 170-420 m., 16 LS 550-700 m., 5 LS 700-900 m. (2) With approaches at W end from Treuchlingen and Landshut lines (Routes 87 and 106) at E end from Austrian lines; comprises 3 separate groups of sidings— (a) 16 LS c. 540 m. long, 8 LS 380 m. long, 8 LS 330-480 m. long. (b) 12 LS c. 500 m., 12 LS c. 210 m., 6 LS c. 120-210 m., 12 LS c. 300 m., 8 DES c. 210-300 m., 8 DES c. 400 m. (c) 6 LS c. 120 m., 3 DES c. 210 m., 10 DES c. 80-250. 3 sheds, 170, 70, and 130 m. x 20 m. Loco Depot: In triangle formed by Routes 82 and 123. 3 ES, holding capacity c. 30 locos each. 2 Tbl c. 25 m., 1 Tbl c. 20 m., 1 ES, capacity c. 15 locos, Tbl c. 20 m. RPS: N of line and opposite main loco depot. Connection to loco shed N of line. Connection to 4 sidings S of line. J (trailing) right, with ST co. line to a distant connection on bank of R. Wurm, c. 2 km. long. Line crosses over— (1) DT electrified line to line to Stuttgart (Route 123). (2) DT electrified line to Treuchlingen and Landshut lines and DT electrified line to Austrian lines.
151.0	
151.2	
*151.3	
*152.3	..	Passer.	
154.2	
155.0	

Km.	Stations	Engineering works	Details and facilities
155-0	..	..	J (trailing) right, with DT electrified line from München (S) and Rosenheim (Route 123).
155-3	..	Road overbridge.	
157-3	..	Road overbridge.	
158-0	MÜNCHEN Hbf.	..	<p>Passenger Station: Terminus, c. 22 platforms, c. 340 m. long. Smaller station to S, possibly for parcels or local trains, c. 4 platforms, c. 260 m. long.</p> <p>Goods Station: N of passenger station. SFR. Wh (30 t). Cr (25 t). 3 large goods sheds—2 of herring-bone design, length c. 300 m., c. 22 DES, c. 300 m. long, each with road access.</p> <p>Carriage Sidings: c. 12 LS, c. 300 m.; c. 8 LS, c. 250-650 m.; c. 10 LS, c. 800 m.</p> <p>For location diagram of München, see Plan 32.</p>

ROUTE 123

KUSFTEIN-ROSENHEIM-MÜNCHEN

General Description

The line runs in a northerly direction to Rosenheim along the valley of the R. Inn, keeping close to the main road, and crossing the old Austro-German border at c. 3-1 km. from Kufstein. At Rosenheim it leaves the main road, and turns NE to München across high, open country on the 500 m. contour-level.

The line crosses several streams, but no important rivers. There is, however, an important bridge over a canalised stream just E of Rosenheim station (marked with asterisk in text), and a road overbridge W of station (also marked with asterisk).

Main junctions are at Rosenheim (with DT electric line from Salzburg; also J with ST s.o. alternative route to München via Holzkirchen; also J, with ST s.o. line to Mühldorf, and a light-railway connection with Westerdorf); at Grafing, J with ST s.o. line to Wasserburg, on Rosenheim-Mühldorf line (Route 109), and at München with Routes 82, 87, 106, 119 and 122.

This line together with Route 123a provides the main route from Italy to Germany via Innsbruck. An alternative route exists from Innsbruck via Partenkirchen (Route 122), but the track is single to Tutzing, and many serious gradients are to be expected.

A further alternative route to Rosenheim is afforded via St. Johann and Salzburg, Route 124, but again heavy gradients are likely to be encountered, particularly between Wörgl and St. Johann, and in addition, a kilometrage of 280-6 km. is entailed for the journey Wörgl-Rosenheim as against 47-3 km. by Routes 123a and 123.

General Details

1. GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
2. LENGTH: 99-2 km. (61½ miles).

3. TRACK: Double.
4. MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
5. MAXIMUM GRADIENT: 12 per mille (1 in 81).
6. MINIMUM RADIUS OF CURVES: 250 m.
7. TRACTION: Electric.
8. MAXIMUM DISTANCE BETWEEN STATIONS: 7-9 km.
9. ENGINE SHEDS:

Kufstein.	München-Ost.
Rosenheim.	München-Pasing.
10. MARSHALLING FACILITIES:

Wörgl.
Rosenheim (Kolbertmoor).
München-Ost, capacity 2,000.
München-Pasing, capacity 2,900.
München-Sud.
11. WATERING FACILITIES: As in 9 above.
12. VULNERABLE POINTS: Marked with asterisk in text.
 - (a) Locomotive and marshalling facilities given in 9 and 10 above.
 - (b) Junctions at 33-1, 38-0, 83-9, 89-1, 94-8 and 97-6 km.
 - (c) Repair shops at München (Pasing, Freimann and Neuaußing).
 - (d) Sub-stations at Rosenheim and München-Pasing.
 - (e) Bridges at 28-3, 33-9 and 92-9 km.

13 CAPACITY:

	Trains per hr. each way	Net ton load per military stores
With electric traction	60-72	100-300
With steam traction	48	100

KUFSTEIN TO MUNICHEN

201

Distance from Kufstein

Km.	Stations	Engineering works	Details and facilities
69.8	BRENNER	..	Route 123 (a).
72.9	INNBRUCK	..	..
80	KUFSTEIN	..	ES. c. 10 LS, E of line. SR. Wb (60 t). Cr (3 t).
86	..	Bridge over main road.	..
87	..	Bridge or culvert over stream.	..
91	..	..	Line crosses the former Austro-German border and continues in a generally northerly direction, in the valley of the Inn, to Rosenheim.
97	KIEFERWILDEN	..	SER. Wb (40 t). Cr (20 t).
100	..	Bridge or culvert over stream.	I, with dead-end. (?) narrow-gauge line to Einfeld (distance c. 5.8 km.).
108	..	Ditto	..
111	..	Ditto	..
112	..	Ditto	..
116	..	Ditto	..
122	OSERAUDBERG	..	SER. Wb (40 t).
123	..	Ditto	..
156	FUCHSBACH (INN)	..	SF. Wb (40 t).
185	..	Ditto	..
192	..	Ditto	..
197	..	Ditto	..
207	..	Ditto	I with dead-end, narrow-gauge line to Wendteich (distance c. 9.1 km.).
209	BRANNENBURG	..	SER. Wb (40 t).
211	..	Bridge over main road.	..
225	..	Bridge or culvert over stream.	..
248	..	Ditto	..
258	..	..	I with DE, narrow-gauge line running W (distance c. 3.5 km.).
263	RAUBLING	..	SER. Wb (30 t).
270	..	Ditto	..
283	..	Bridge over Autobahn.	..
287	..	Bridge over main road.	..
328	..	Bridge over stream (Mühl).	..
331	..	..	J (trailing) right, with DT electric line from Sakburg (distance from Rosenheim 88.5 km.). (Route 109.)
332	..	Bridge or culvert over stream.	..
339	..	Bridge over canalised stream.	..
342	ROSENHEIM	..	Electric sub-station. SER. Wb (40 t). Cr (7.5 t). ES, 2 J RH with Tbls and RpS. MY at Kolbermoor (on Holzkirchen line).
350	..	Road overbridge.	..
351	..	..	J (facing) left, with ST co. line to Holzkirchen (distance 17.2 km.).
353	..	Bridge or culvert over stream.	..
362	..	Ditto	..
367	..	Ditto	..
370	..	..	I facing right with ST co. line to Mühldorf (distance 17.5 km.).

Km.	Stations	Engineering works	Details and facilities
47.1	GRAB KARLSFELD	..	SER. Wb (40 t).
47.8	..	Bridge or culvert over stream.	
48.1	..	Ditto	
47.5	OTTERMÜNCHEN	..	SER. Wb (30 t).
47.5	..	Bridge or culvert over stream (Mozach).	
47.7	..	Ditto	
54.1	ASLING (OBERBAY)	..	SER. Wb (30 t).
58.4	OBERÖLROFEN	..	Restricted goods facilities (up to 250 kg. per package).
60.7	..	Ditto	
61.0	..	..	J (trailing) right, with ST, s.o. DE, line from Wamberg Stadt (distance 29.1 km.). Also, J (trailing) left, with ST, s.o. DE, line from Glonn (distance 10.6 km.).
61.5	GRAVING BHF.	..	SER. Wb (30 t).
66.1	..	Road overbridge.	
66.6	KIRCHSEON	..	SER. Wb (30 t).
68.3	..	Bridge over main road.	Sleeper manufacturing plant.
68.7	EOLHARTING	..	Passenger station. Restricted cattle and parcels facilities.
71.2	ZORNEDING	..	SER. Wb (30 t). Line begins straight stretch to Trudering, c. 13.3 km. long, passing through high, level country and woodland.
74.8	BALDHAM	..	Passenger station. Restricted cattle and parcels facilities.
76.5	VATERSTETTEN	..	Passenger station. Restricted cattle and parcels facilities.
79.2	H.AB	..	SER. Wb (30 t).
81.7	GRONSDORF	..	Restricted goods facilities (up to 250 kg. per package).
84.5	MÜNCHEN-TRUDERING	..	SER. Wb (30 t).
85.9	..	..	J (trailing) right, with DT s.o. line from Simbach (Route 100).
86.8	MÜNCHEN-OTF	..	MF capacity 2,000 wagons per 24 hours. ES. Tbl. W. SER. Wb (60 t). Cr (30 t).
89.1	..	..	J (trailing) right, with ST line from Johanneskirchen and München-Freimann.
89.1	MÜNCHEN-OTF	..	Passenger station. For details see page 201.
90.2	..	..	J (trailing) left, with ST line to München-OTF.
91.9	..	Bridge over R. Isar	
91.2	..	..	J (trailing) left, with DT line to München-OTF and Trudering.
91.3	MÜNCHEN-OTF	..	

Km.	Stations	Engineering works	Details and facilities
97.3	..	..	<p>Goods Yard: SER. Wb (40 t). Cr (20 t). c. 22 LPS (9 x 210-270 m., 13 x 4, 270 m.).</p> <p>J (facing) left, with DT keep line to München Pasing MY, giving connections avoiding München Hbf to Routes 82, 87, 105, and 117, for Augsburg, Treuchtlingen, Landshut, and Buchloe.</p> <p>J (trailing) left, with DT line from Stuttgart, Treuchtlingen, Landshut and Buchloe.</p> <p>Line runs multiple track.</p> <p>Connection to small yard S of line comprising 8 DES c. 210 m., 8 LS 140-340 m.</p>
97.5	..	..	<p>a road overbridges.</p>
99.2	MÜNCHEN Hbf	..	<p>Passenger Station: Terminus c. 22 platforms c. 340 m. long; smaller station to S, possibly for parcels or local trains, c. 4 platforms c. 260 m. long.</p> <p>Goods Station: N of passenger station. SER. Wb (30 t). Cr (25 t). 3 large goods sheds—2 of herring-bone design—each c. 300 m., c. 22 DES c. 300 m. long, each with road access.</p> <p>Carriage Sidings: c. 12 LS c. 300 m., c. 8 LS c. 250-650 m., c. 10 LS c. 800 m.</p>
•	MÜNCHEN PASING	..	<p>Loco Depot: 3 ES (semi-circular), capacity c. 30 locos each. 2 Tbl (25 m.), 1 Tbl (20 m.). 1 ES (1 RH), capacity c. 15 locos. Tbl (20 m.). RPS (loco).</p> <p>Marshalling Yard: Capacity 2,500 wagons per 24 hours.</p>
•	MÜNCHEN-NEUAUBING	..	<p>RPS: Passenger rolling stock. Staff employed, 3,000.</p>
•	MÜNCHEN-FREIMANN	..	<p>RPS: Loco (diesel and electric). Staff employed, including operating personnel at main station, 4,600.</p>
	MÜNCHEN-Ost		<p>Station for railway personnel only. 1 island platform, 250 m. long.</p> <p>Marshalling Yard: N of line—comprises 3 separate groups of sidings—</p> <p>(1) for westbound traffic: c. 6 LS c. 425 m. long, c. 12 LS c. 425-700 m., 9 LS 210 m.-320 m.</p> <p>(2) for eastbound traffic: 9 LS c. 250 m. long, 16 LS c. 300-700 m.</p> <p>(3) for traffic from and to Ismaning Ringbahn: 2 groups of c. 8 LS each c. 700 m. long.</p> <p>Loco Park: S of line. ES (rectangular), c. 200 m. long x 130 m. wide. c. 18 tracks. Tbl c. 25 m. W.</p> <p>2 groups of DES at W end of loco yard, 1 S, 3, 1 S, 3, each c. 100 m. long.</p> <p>2 groups of DES at W end of MY, N of loco yard, 1 S, 3, 1 S, 3, each c. 100 m. long.</p>

Km.	Stations	Engineering works	Details and facilities
			Separate yard for "small" traffic. 4 DKS 290 m., 2 DKS c. 130 m. Goods shed c. 300 x 36 m. served by c. 4 DKS c. 360 m. Passenger Station: 6 platforms (3 islands) c. 250 m. long, c. 14 through tracks, including goods lines.

ROUTE 123A

BRENNER-INNSBRUCK-WÖRGL-KUFSTEIN

General Description

The Brenner railway runs from München via Kufstein, Wörgl and Innsbruck to Bolzano, Trento and Verona. It is the shortest and most important supply route between Germany and Italy. It is DT (with the possible exception of the Kufstein-Wörgl section) and electrified throughout, but there is a change of system at Brenner from the Austrian standard of 15,000 volts A.C. to the Italian system. Electrification has considerably increased the capacity of the Austrian section of the line, which is built on a continuous upgrade from Innsbruck to Brenner, usually of 25 per mille.

Between Brenner and Innsbruck the line follows the narrow, winding and thickly wooded valley of the R. Sill, usually running on a shelf above the river. There is a loop E at St. Jodok. The Sill valley is also followed by the Brenner road, which often runs on the opposite side to the railway. Tunnels are frequent, though there is no tunnel at the pass itself, and there are several bridges over the R. Sill.

Marshalling is carried out at Innsbruck, as facilities at Brenner are limited. The small amount of level ground between Innsbruck and Brenner (and also between Brenner and Bolzano in Italy) leaves little room for loops, sidings and yards, and makes some of the station layouts rather cramped. This does not prevent the line's capacity being high, but the consequences of a block on the line from any cause for more than a few hours are likely to be felt as far N as München, and as far S as Verona, since there are so few sidings where trains could be held back.

At Innsbruck the line enters the Inn valley, which it descends for the remainder of its length. Between Innsbruck and Kufstein the valley has an average width of 1-2 km., with hills, often wooded, rising steeply beyond. This section of the Brenner route, in marked contrast to the section between Brenner and Innsbruck, has very easy gradients and comparatively few curves, usually of wide radius. The main engineering works are 3 large bridges over the Inn, the first of which occurs immediately N of Innsbruck, the second just W of Brühl (80.9 km.), and the last between Wörgl (96.5 km.) and Kufstein.

The only J of any importance occurs at Wörgl, whence runs a DT s.o. line WSW to Schwarzach-St. Veit and thence N to Salzburg (R. 22 124). At Wörgl R. 22 124 then turns NNE, still in the Inn valley. Kufstein is reached at 109.9 km., and the former Austro-German border is crossed at 112.2 km., the line continuing in a generally northerly direction in the Inn valley to Rosenheim (for München). There is some doubt whether the Wörgl-Kufstein section is still S.T. or some unworked part of its doubling has been completed.

General Details

- GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
- LENGTH: 109.9 km. (68½ miles).
- TRACK: Double, except between Wörgl and Kufstein, though this section may now have been doubled.
- MAXIMUM PERMISSIBLE AXLE LOAD: 20 metric tons.
- MAXIMUM GRADIENTS:
 - 25.5 per mille down between Matri and Patsch.
 - 2.5 per mille up between Schwaz and Jenbach.
- MINIMUM RADII OF CURVES:
 - 235 m. between Schafstau and Kufstein.
- TRACTION: Electrified (15,000 volts A.C. single-phase, 16½ cycles). Sub-stations at Matri, Solbad Hall and Wörgl, deriving power from Ruets and Achensee power stations, and Walchensee power station in Bavaria.
- MAXIMUM DISTANCE BETWEEN STATIONS:
 - 8.6 km. (5½ miles) (Matri-Patsch).
- ENGINE SHEDS:

Brenner (small shed for Italian locomotives).	
Innsbruck.	Wörgl.
Jenbach.	Kufstein.
- MARSHALLING FACILITIES:

Innsbruck.	Wörgl.
Normally no marshalling at Brenner.	
- WATERING FACILITIES:

Brenner.	Patsch.	Jenbach.
Gries.	Innsbruck.	Wörgl.
Steinach.	Solbad Hall.	Kufstein.
Matri.		
- VULNERABLE POINTS: Marked with asterisk in text.

Line especially vulnerable between Brenner and Innsbruck.

 - (a) Locomotive and marshalling facilities given in 9 and 10 above.
 - (b) Staffach tunnel (7.6 km.), St. Jodok tunnel (9.3 km.), Mühlbach tunnel (25.3 km.), tunnel (29.0 km.), tunnel (33.8 km.), Berg Isel tunnel (34.0 km.), and short tunnel (3.5 km.).
 - (c) J at Wörgl.
 - (d) Bridge over R. Sill (15.1 km.), Bridge over Mühlbach (25.2 km.), Sonnenburg bridge over R. Sill (33.5 km.), Bridges over R. Inn (44.4, 80.9 and 101.9 km.). There are numerous other smaller tunnels and bridges, and the line frequently runs on a narrow shelf high above the valley of the R. Sill whose course it follows.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
With electric traction	72	720
With steam traction		
Brenner- Innsbruck	48	250-300
Innsbruck-Wörgl- Kufstein	72	500

14. SIGNALLING: Block working with block instruments.

15. TRAIN DISPATCHING: In force; control centres at Innsbruck and Wörgl.

16. REPAIR SHOPS: Innsbruck W.

Distance from Brenner

Km.	Stations	Engineering works	Details and facilities
0.0	BRENNER Alt. 1,370 m., mg. 25 down, mrc. 250 m.		Frontier station. SR. W. 8 LS (900 m.) E of station, 2 serving covered platforms 280 m. long (probably for customs examina- tion of freight). DES 220 m. long at each end, between these 2 LS. Several DES on each side of main line at S end with access from N. Turn- ing by means of the "Brenner Star"—an elaborate turning tri- angle. The triangle lies NW of the station and there is a small local goods yard and shed adja- cent with 2 DES (150 m.) approached from N; also prob- ably Tbl for electric locos. Line runs N from Brenner making a continuous descent to Inns- bruck. Beyond the bridge over the Sill Bach at 0.8 km. the line closely follows the thickly wooded narrow valley of that river all the way to Innsbruck (except for a sharp loop E at St. Jodok). The Sill valley is also followed by the Brenner road, frequently on the opposite bank of the river to the railway. The railway usually runs on a shelf well above the river. Italo-Austrian frontier.
0.5	..		
0.8	..	Bridge over R. Sill.	
1.3	BRENNER (Halt) Alt. 1,309 m., mg. 25 down, mrc. 250 m.		SR. Note. The small lake after which this halt is named is now either drained or camouflaged.
1.5	..	Bridge over road.	
1.6	..	Bridge over Vennarbach. Long embankment.	
3.1	..	Bridge over stream.	
5.0	..	Road overbridge.	
5.4	GRIES (Halt) Alt. 1,254 m., mg. 25 down, mrc. 280 m.		SR. W. Gradient.
6.0	..	Tunnel.	c. 100 m. long.
7.6	..	Stallach tunnel.	283 m. long, on curve E. Line now leaves Sill valley to approach St. Jodok.
9.1	..	Bridge over Valsertach.	
9.3	..	St. Jodok tunnel.	108 m. long, on curve to NW.
10.1	..	Bridge over Schminnerbach.	
10.2	St. Jodok (Halt) Alt. 1,113 m.		Line curves N, ascending, the S. of valley and continuing to E. of the S. bank of the river.
11.0	..		

Km.	Stations	Engineering works	Details and facilities
11.6	..	Bridge over stream.	
12.7	..	Road overbridge.	
12.6	..	Bridge over Padasterbach.	
14.4	STEINACH (TYROL) Alt. 1,047 m., mg. 17.2 down, mrc. 325	..	Gradient 18.9 per mille down. SR. W. LS (800 m.) on P. Small goods yard and shed on W with LS (300 m.) and a DES (120 m.).
*15.1	..	Bridge over R. Sill.	Girder span of 16 m., total length c. 28 m. Line now follows W bank of river.
16.8	..	Bridge over road.	
18.4	..	Bridge over stream.	
18.9	MATREI Alt. 993 m., mg. 25.5 down, mrc. 240	..	Gradient 25 down. W. SR. Wb (30 t). SS. N of station, E of line. LS (700 m.) on E and DES (230 m.) on W. LS (700 m.) Small goods yard and shed with SR and DES (150 m.) with access from N. ER and SR c. 70 m. long at side of main roadway.
19.4	..	Bridge over R. Sill.	Masonry, span 18 m.
19.6	..	Road overbridge.	
20.1	..	Bridge over R. Sill.	
20.2	..	Tunnel.	c. 150 m. long.
20.4	..	Bridge over R. Sill.	
21.2	..	Bridge over stream.	
21.9	..	Tunnel.	c. 100 m. long.
22.7	..	Bridge over stream.	
24.8	..	Tunnel.	c. 75 m. long. Line curves NW, running on a ledge on the mountainside be- tween the preceding tunnel and the bridge over the Mühlbach.
*25.2	..	Bridge over Mühlbach.	Girder, single span, total length 40-50 m., southern anchorage on rock ledge.
*25.3	..	Mühlbach tunnel.	872 m. long.
26.4	..	Tunnel.	c. 100 m. long.
27.5	PATICH Alt. 779 m., mg. 25 down, mrc. 284 m.	..	Gradient 25 down. W. 2 or 3 sidings.
28.2	..	Tunnel.	c. 100 m. long.
*29.0	..	Tunnel.	c. 200 m. long.
30.3	..	Tunnel.	c. 100 m. long.
30.9	UNTERBERG- STEFANBRÜCKE (Halt)	..	SR.
31.0	..	Tunnel.	c. 50 m. long.
31.6	..	Tunnel.	c. 150 m. long.
*33.5	..	Sonnenberg bridge, over R. Sill.	Girder, span c. 25 m.
*33.8	..	Tunnel.	c. 300 m. long. Line curves ENE.
*34.9	..	Berg Isel tunnel.	622 m. long, on curve to N.
35.7	..	Bridge over road and railway.	Masonry, two small spans, second over narrow gauge, electric Mittelgebirgsbahn from Berg Isel station (100 m. to the W) to Isch, 3 km. to the SE, thence aerial railway to the Pustel Koch.
35.9	..	End of line out. Bridge over road.	c. 100 m. long. Line N. of the road and railway from Isch to the Pustel Koch c. 100 m. long. The line is now a narrow gauge railway from Isch to the Pustel Koch c. 100 m. long. The line is now a narrow gauge railway from Isch to the Pustel Koch c. 100 m. long.

Km.	Stations	Engineering works	Details and facilities
36.1	..	Bridges over arm of R. Sill.	two could easily be joined up to form a goods loop by-passing the passenger station.
37.0	INNBRUCK Hbf. Alt. 582 m., mg. 4 down, mrc. 280 m.	..	<p>S.R. Wb (35 t). Cr (20 t). W.</p> <p>Passenger station:</p> <p>3 platforms (2 island), 5 through platform tracks and 3 through roads. 4 bay platform tracks at S end, also 4 or 5 DES serving goods shed. A fourth through road serves the main goods shed.</p> <p>Loco Depot: ES. S of station, between running roads and MY: 72 electric locos maintained in 1935, and 375 staff employed. 2 roundhouses of 21 covered tracks each, served by 2 tbls, not of equal size. Southern shed and half northern shed wired for electric locos, other half for steam locos. Coal stacks and 2 coaling platforms, served by 3 tracks, at S end of depot.</p> <p>Marshalling Yard: E of station on left bank of R. Sill: 17 LS (300-600 m.) running to 2 shunting necks at S end, 2 serving loading platforms c. 250 m. long and 2 serving transshipment sheds along E side of yard with SR c. 150 m. long. MY connected at N end with main line by a DT connection with bridge over goods yard.</p> <p>Goods Station: Immediately E of passenger station between through roads and MY: 2 sheds and several DES, 7 short DES with shed and road access NE of MY. Goods station and shunting yard at Innsbruck Westbf on the Arlberg line (Route 121).</p> <p>Loco and Wagon RAS: Unidentified sheds N of ES, S of goods station. These formerly consisted in part of wagon repair shops and had a traversing table at either end, but the latter appears to have been removed (July, 1943).</p> <p>J (trailing) with—</p> <p>(1) ST electrified line W to Feldkirch, Bregenz and Lindau (Arlberg line, Route 121).</p> <p>(2) ST electrified line W and N to Scharnitz branching from Route 121 at Innsbruck Westbf.</p> <p>Line runs N from Innsbruck, then curves ENE, closely following the N bank of the Inn, whose valley (average width 1-2 km.) the line descends for remainder of its length.</p> <p>Maximum: 1,200 m. long, 175 m. high. The viaduct starts at Mitten, curve, immediately N of the Hauptbahnhof, and runs N to the first curve. It then curves E and N, following the N bank of the Inn, and then curves E and N, following the N bank of the Inn, and then curves E and N, following the N bank of the Inn.</p>

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
*39.4	..	Large bridge over R. Inn.	c. 170 m. long, girders: 3 spans over river and one over road.
41.3	..	Road overbridge.	
41.9	..	Bridge over road embankment.	
42.1	RUM (Halt)		
45.6	SOLBAD HALL IN TYROL. Alt. 561 m., mg. 2.05 down, mrc. 746.	..	W. At least 8 sidings S of line. SSc.
47.6	..	Bridge over Weissenbach.	
48.3	..	Road overbridge.	
50.0	VOLDERS-BAUMKIRCHEN (Halt)		
51.3	..	Bridge over Fall Bach.	
52.3	..	Bridge over stream.	
52.9	..	Bridge over Baren Bach.	Within station limits.
53.0	FRITZEN-WATTENS Alt. 555 m., mg. 2.5 down, mrc. 500	..	At least 1 siding N of line. Wooded hills closely approach side of line.
56.9	TERFEN-WEER Alt. 548 m., mg. 4.5 down, mrc. 470 m.		
60.6	..	Bridge over Vomper Bach.	
60.8	..	Road overbridge.	
63.8	SCHWAZ Alt. 538 m., mg. 4.0 down, 2.5 up, mrc. 310 m.	..	At least 1 siding W of line.
65.9	..	Bridge over stream.	
66.1	..	Bridge over Stanser Bach.	
66.2	STANS BEI SCHWAZ (Halt)		
70.0	..	Bridge over stream.	
70.8	..	Bridge over stream.	
71.0	..	Road overbridge.	
*71.4	JENBACH Alt., mg. 1.4 down, 1.7 up, mrc. 275 m.	..	W. At least 2 sidings SE of line. Connections with— (1) ST s.o. narrow-gauge (1 m.) dead-end line NNW to Achen-see; 6.7 km. long. (2) ST s.o. narrow-gauge (0.76 m.) dead-end line (Zillertalbahn) S to Mayrhofer; 31.8 km. long; line ascends the narrow, wooded valley of the Ziller.
73.6	..	Bridge over stream.	
75.0	MÜNSTER-WIESING (Halt)	Embankments.	Series of embankments between Münster and Brixlegg.
76.8	..	Bridge over stream.	Masonry.
79.0	..	Bridge over stream.	Masonry.
79.2	..	Culvert.	
*80.5	..	Large bridge over R. Inn.	Masonry c. 200 m. long.
80.9	BRIXLEGG Alt. 528 m., mg. 4.5 down, mrc. 1,000 m.	..	At least 2 sidings N of line.
81.4	..	Bridge over road.	
*82.0	..	Tunnel.	c. 200 m. long.
82.2	RAUSCHENBURG-KRAMACH	Tunnel.	
82.4	..	Bridge over road.	
82.6	..	Tunnel.	
82.8	..	Tunnel.	

Km.	Stations	Engineering works	Details and facilities
83.3	..	Bridge.	Masonry.
84.1	..	Bridge over stream.	Masonry.
85.1	..	Ditto	Masonry.
88.3	..	Ditto	Masonry.
89.2	..	Ditto	Masonry; skew.
89.7	..	Ditto	Masonry.
89.9	KUNDL Alt. 640 m., mg. 4.8 down, 2.5 up, mrc. 500 m.	Embankments.	At least 1 siding both N and S of line. Series of embankments between here and Wörgl.
90.6	..	Bridge over Wildschönauer Ache.	Masonry.
91.2	..	Bridge over stream.	Masonry.
91.6	..	Ditto	Masonry.
93.3	..	Ditto	Masonry.
95.0	..	Ditto	Probably girder.
95.1	..	Culvert.	Under E end of Wörgl MY.
*96.3	WÖRGL Alt. 505 m., mg. 4.6 down, mrc. 680 m.	..	Passenger Station: SER. Wb (30 t). W. 3 LS and 1 DES for passenger sta- tion. Electric sub-station. Loco Depot: Along N side of MY; RH with 9 covered and 3 open tracks served by Tbl with 3 approach tracks. Second Tbl to E with c. 25 radial stabling tracks in open. E of this again is a rectangular dead-end shed served by 3 or 4 DES with 4 or 5 DES in open, probably RpS. Marshalling Yard: N of line; 22 LS, covering an area 2,500 ft. by 500 ft.; fully electrified. To W of yard, ground cleared on both sides of main line for extension to sidings. J (facing) right, with DT electri- fied line ESE to Zell am See and Schwarzach St. Veit, thence N to Salzburg (Route 124). ST Section Begins: Some reports state that the Wörgl-Kufstein section has been doubled.
97.0	..	Bridge over Brixentaler Ache.	..
100.3	KIRCHBICHL Alt. 497 m., mg. 3.3 down, mrc. 380 m.	..	At least 1 siding both E and W of line.
101.1	..	Large bridge over R. Inn.	Braced through girder construc- tion. New span on left.
*101.9	..	..	..
102.8	..	Bridge over stream.	..
103.3	LANDEKAMPFEN (Halt)	..	..
103.4	..	Bridge over stream.	..
103.6	SCHAFFENAU Alt. 486 m., mg. 3.3 down, mrc. 225 m.	..	At least 1 siding E of line.
103.9	..	Bridge over stream.	..
104.3	SEINFELDER (Halt)	..	..
*104.9	KUFSTEIN Alt. 419 m.	..	..
105.1	..	..	..

Km.	Stations	Engineering works	Details and facilities
112.2			Line crosses the former Austro-German border and continues in a generally northerly direction, in the valley of the Inn, to Rosenheim (for München). Line continues to München as Route 123.

ROUTE 124

WÖRGL-ST. JOHANN-SALZBURG-ROSENHEIM

General Description

Connecting with Route 123 (Brennero-Kufstein) this line forms the main route from Italy to Salzburg, where it connects with the main lines from Vienna and Linz, before proceeding W to Rosenheim and München.

The principal junctions are at Wörgl with Route 123 direct line from Innsbruck to München, at Schwarzach-St. Veit with the ST electric line from Villach (Route 123), at Salzburg with the main line from Vienna and Linz, and at Rosenheim, where it once more joins Route 123.

The line is DT and electrified throughout and passes through mountainous country, giving a maximum gradient of 25 per mille up and 22.5 per mille down. Double heading is required where these gradients occur, i.e. in the sections St. Johann-Hochfilzen, and Hochfilzen-Saalfelden. See Plan 51 giving profile of line.

The line is particularly vulnerable from the point of view of tunnels and bridges, the most important of the latter being between Bruck-Fusch and Salzburg where the line follows the R. Salzach.

General Details

- GAUGE: 1435 mm. (4 ft. 8½ in.). Standard.
- LENGTH: 280.6 km. (174½ miles).
- TRACK: Double.
- MAXIMUM PERMISSIBLE AXLE LOAD:
Wörgl-Salzburg Hbf, 18 metric tons.
Salzburg Hbf-Rosenheim, 20 metric tons.
- MAXIMUM GRADIENTS:
25.0 per mille up (see Plan 51).
22.5 per mille down.
- MINIMUM RADIUS OF CURVES: 100 m. (see Plan 51).
- TRACTION: Electric, 15,000 volts A.C. 16½ cycles, single-phase.

(8) MAXIMUM DISTANCE BETWEEN STATIONS:

9.9 km. (6¼ miles).
Sulzau 153.5 km.-Golling-Abtenau 163.4 km.

9. ENGINE SHERDS:

Wörgl. Freilassing.
Bischofshofen. Rosenheim.
Salzburg.

10. MARSHALLING FACILITIES:

Wörgl. Freilassing.
Salzburg. Rosenheim.

11. WATERING FACILITIES:

Wörgl. Schwarzach-St. Veit.
Kitzbühel. Bischofshofen.
Hochfilzen. Salzburg.
Saalfelden. Freilassing.
Bruck-Fusch. Rosenheim.

12. VULNERABLE POINTS: Marked with asterisk in text.

- Marshalling and locomotive facilities given in 9 and 10 above.
- Junctions at Wörgl, Schwarzach St.-Veit, Salzburg and Rosenheim.
- Power station at Saalbach near Bad Reichenhall.
- Sub-stations at Wörgl, Kitzbühel, Saalfelden, Schwarzach-St. Veit, Golling and Rosenheim.
- Tunnels at 12.7, 14.7, 109.9, 119.9, 123.7 and 159.4 km.
- Bridges at 20.3, 33.2, 83.5, 87.1, 97.4, 99.4, 113.7, 117.6, 126.8, 140.7, 159.3, 194.4, 226.4 and 278.0 km.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
With electric traction	48	400
With steam traction	36	300

Distance from Wörgl

Km.	Stations	Engineering works	Details and facilities
0	WÖRGL		Electric sub-station. SER. Wh. 3210. M.Y.N. of line, W. of junction. ES. P.E. (not electric) S. W. Junction of line with R. Salzach. W. of Wörgl. 12.7 km. (8 miles). Junction of line with R. Salzach. Junction of line with R. Salzach. Junction of line with R. Salzach. Junction of line with R. Salzach.

Km.	Stations	Engineering works	Details and facilities
			J (facing) left, with ST electrified line to Kufstein (Route 123a). Line crosses road. Line runs SE for c. 13 km. and in the valley of the R. Kelchsauer Ache for c. 10 km.
1.3	..	Road bridge carrying main road.	
3.3	SOLL-LEUKENTHAL	..	SR. Wb (30 t).
6.9	..	Bridge over road.	
7.3	..	Bridge over R. Kelchsauer Ache.	
8.0	..	Bridge over road. Bridge over stream. Road overbridge.	
8.6	HOPFGARTEN (TIROL)	..	SR. Wb (30 t). At least 1 storage siding each side of line.
10.2	..	Bridge over minor road.	Line crosses road.
11.2	..	Bridge over stream.	Line curves very sharply left and runs in a north-easterly direction for a short distance. On curve, c. 300 m. long.
12.7	..	Tunnel.	
13.2	..	Bridge over stream.	Line curves sharply right and runs in a generally easterly direction almost to Kitzbuhel. On curve c. 400 m. long.
14.7	..	Tunnel. Bridge or culvert over stream.	
15.6	WINDAU	..	Passenger halt. Line crosses minor road.
18.9	WESTENDORF	..	SR. At least 1 storage siding each side of line.
19.3	..	Bridge over stream.	Line crosses minor road.
20.4	..	Bridge or culvert over stream. Bridge over stream.	
21.9	LAUTERBACH	..	Passenger halt.
		Bridge or culvert over stream.	Line crosses minor road.
		Ditto	
25.6	KIRCHBERG (TIROL)	..	SR. Wb (30 t). At least 1 storage siding each side of line. There are 2 passenger halts between Kirchberg and Schwarze called Kalwirt and Klausen, distances not known. Line crosses road.
26.7	..	Bridge over stream.	Line crosses minor road.
28.3	..	Bridge over R. Rain Ache.	Line crosses 4 roads.
30.5	SCHWARZEE (TIROL)	..	Passenger halt. Line crosses several roads.
32.5	HAINSENNAUER	..	Passenger halt. Cable railway runs from here to Hainseck for c. 1.5 km. Line crosses several roads.

Km.	Stations	Engineering works	Details and facilities
			Line crosses several minor roads, some of them by bridges before reaching Kitzbühel. Line curves very sharply left and runs N.W. to Kitzbühel.
*33.2	..	• Bridge over R. Jockberger Ache.	
33.3	..	Bridge over main road.	Line runs in the valley of the R. Kitzbühler Ache.
*35.0	KITZBUHEL	..	Electric sub-station. SER. Wb (30 t). W. 2 LS, N of line, 1 LS S of line.
36.5	..	Bridge over stream (Walsen).	
38.5	..	Bridge over stream.	Line crosses minor road.
40.1	WILSENACHWANG-OBERNDORF	..	Passenger halt.
40.8	..	Bridge or culvert over stream.	
			Line crosses main road. Line makes a wide curve right, and after St. Johann runs in a mainly E or ESE direction until reaching Saalfelden.
42.9	..	Ditto	Line crosses main road.
44.5	ST. JOHANN (TIROL)	..	SER. Wb (30 t). Turning facilities. At least 1 LS each side of line. Double heading required to Hochfilzen. Gradient of 25.0 per mille up. Line crosses secondary road.
46.0	..	Bridge or culvert over stream (Wend).	
46.8	..	Bridge or culvert over stream.	
47.3	..	Ditto	
49.5	..	Ditto	Line crosses 2 minor roads.
52.8	FIEBERBRUNN	..	SER. Wb (32 t).
53.3	..	Bridge over stream.	Line crosses secondary road. Line crosses minor road several times.
57.7	PFÄFFENSCHWENDT	..	Passenger halt. Line crosses minor road.
60.6	..	Bridge or culvert over stream (Rothache).	Line crosses 2 minor roads.
62.1	HOCHFILZEN	..	SER. W. 3-track through station. 1 LS W of line. Gradient of 22.5 per mille down. Line crosses 2 minor roads.
66.0	..	Bridge over stream.	
66.9	..	Bridge over stream (Griesen).	Line crosses 3 minor roads.
70.3	..	Bridge over stream (Reitet).	
71.7	LEOGANG	..	SER. Wb (30 t).
74.0	LEOGANG-STEINBERGER	..	Passenger halt.
		Bridge over stream (Birn).	Line crosses 2 minor roads. Line curves right and runs SE to Saalfelden. Line crosses minor road to left of line.

WORGL TO ROSENHEIM

1913

Km.	Stations	Engineering works	Details and facilities
77.5	..	Bridge over stream (Leogang).	
77.7	..	Bridge over road.	
78.6	..	Ditto	
78.6	..	Bridge over stream.	
*77.9	SAALFELDEN	..	2 storage sid. 40 left of line. Shunt yard with at least 8 LS right of line. Electric sub-stations. SER. Wb (30 t). W. Turning facilities. Line runs S. Line crosses main road.
83.2	..	Ditto	
*83.5	..	Bridge over R. Saale (Salach).	Line crosses minor road.
84.2	GERLING (PINZGAU)	..	Passenger halt. Line crosses minor road.
*87.1	..	Bridge over R. Saale (Salach). Bridge over minor road.	Line crosses minor road.
88.2	MAHNOFEN-SAALBACH	..	SER. Wb (30 t). 2 LS W of station. Line crosses 3 minor roads. Line skirts the Zeller See for a 3 km.
92.1	..	Bridge over stream (Schmitter).	
92.8	ZELL AM SEE	..	SER. Wb (30 t). 1 LS W of line. Line runs SE to Bruck-Fusch. There is a cable railway from Zell am See to Schmitzenhöhe (mountain station 1,968 m. high). (See photographs 17 and 17a.) Interchange station for dead end ST narrow gauge (0.76 m.) line to Krimml (32.8 km.). Max. permissible axle load 7.5 metric tonnes. Line crosses 2 minor roads. Line crosses main road.
95.6	..	Bridge over stream.	Line crosses minor road.
97.1	..	Bridge over stream.	Line crosses minor road.
*97.4	..	Bridge over R. Salzach.	Line crosses minor road. Line crosses main road.
98.5	BRUCK-FUSCH	..	SER. Wb (30 t). W. 1 LS W of line. Line runs E then NE to St. Johann. Line follows valley of R. Salzach to Salzburg.
99.0	..	Bridge or culvert over stream (Ach).	
*99.4	..	Bridge over R. Salzach.	
101.0	..	Bridge or culvert over stream.	
101.5	..	Ditto	
102.4	..	Ditto	
103.1	..	Ditto	
103.4	GRIPS (PINZGAU)	..	Passenger halt.
104.6	..	Ditto	
107.1	..	Ditto	
107.9	TANNENAU-RUEGEN	..	SER. Wb (20 t). 1 LS for storage each side of line. Line crosses minor road. 2,400 m. long.
*111.0	..	Tunnel.	
111.2	KALTENBRUNNEN	..	Passenger halt. 2,400 m. long.
*111.4	..	Tunnel.	

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
113-1	ESCHENAU (PINEAU)	Bridge over R. Salzach.	Passenger halt.
*113-7	"	"	Line crosses main road.
114-2	"	Bridge or culvert over stream.	
115-6	"	"	
117-3	LEMO	"	SR. Wb (30 t). 1 LS for storage each side of main line.
*117-6	"	Bridge over R. Salzach and main road.	
120-8	"	Bridge over main road.	Line crosses main road.
121-5	"	Bridge over stream.	
123-3	"	Bridge or culvert over stream.	
*123-7	"	Tunnel.	c. 200 m. long.
124-5	"	Bridge or culvert over stream.	
"	"	"	J (trailing) right, with electrified line from Spital-Mühlentauern, Route 125. This line is ST to Buchstein, and after that partly DT and partly ST.
125-7	SCHWARZACH-ST. VERT	"	Electric sub-station. SR. Wb (33 t). W. Turning facilities. 3 tracks through station. 2 LS W of line, 4 LS E of line.
*126-8	"	Bridge over R. Salzach.	
130-4	"	Bridge or culvert over stream.	Line crosses main road. Line crosses minor road.
130-9	ST. JOHANN IM PONSAL	"	SR. Wb (35 t). 1 LS for storage W of line, 2 LS E of line. Line now runs mainly N to Salzburg.
132-0	"	Bridge over stream.	Line crosses 2 minor roads. Line crosses main road.
135-9	"	Bridge over stream (Mühl).	
137-1	"	"	
138-9	MITTERBERGMÜTTEL	Bridge over stream (Gaimfeld).	Passenger halt.
139-5	"	"	
*139-7	BACHOFENHOFEN	"	SR. Wb (30 t). ES. Tbl. W. Storage sidings: 2 LS left of line, 4 LS right of line.
140-2	"	Bridge over minor road.	
140-3	"	"	J (facing) right, with ST a.o. line to Selthal.
*140-7	"	Bridge over R. Salzach.	
142-1	"	Bridge over main road.	
142-3	"	Bridge over stream.	Line crosses main road.
145-6	DORFWEIPEN	"	Passenger halt. Line crosses minor road.
146-5	"	Ditto	Line crosses minor road.
148-5	WERN	"	SR. Wb (30 t). 1 LS for storage each side of line. Line crosses minor road.
149-1	"	Bridge over stream.	
150-1	KESSELBRUNNEN	"	Passenger halt.

Km.	Stations	Engineering works	Details and facilities
153.5	SULZAU	Road overbridge.	SR.
153.6	..	Bridge over stream.	Carrying main road.
153.9	..	Ditto	
155.5	..	Ditto	
156.5	..	Bridge over R. Salzach.	
*159.3	..	Tunnel.	c. 500 m. long.
*159.4	..	Bridge over R. Salzach.	Line crosses minor road.
*159.5	..		
159.8	..	Bridge over R. Lammer Durnetz.	Line crosses 3 minor roads.
*163.4	GOLLING-ARTENAU	..	Electric sub-station. SER. Wb (35 t).
164.3	..	Bridge over stream.	
166.1	..	Ditto	Line crosses minor road.
167.1	KUCHL	..	SR. Wb (35 t). 1 LS for storage E of line.
168.5	..	Bridge over stream.	
170.1	..	Bridge over stream (Taugl).	Line crosses main road.
171.3	VIGAU	..	Passenger halt.
171.9	..	Bridge over minor road.	J (trailing) left, with short dead-end spur.
172.9	..	..
173.9	..	Bridge or culvert over stream.	Line crosses road.
174.4	HALLAU	..	SER. Wb (35 t). 1 LS for storage left of line, 2 LS right of line. Immediately after station.
174.7	..	Bridge over R. Alm. Bridge or culvert over stream.	Line crosses minor road. J (facing) left, with short dead-end line c. 2 km. long which crosses R. Salzach.
174.8	..	..	Line crosses minor and secondary road. (?) Line crosses main road. (This road is marked as projected on map.) Line crosses minor road.
177.7	PUCH-OBERRALM	..	SR.
179.2	..	Bridge over stream.	
180.3	..	Ditto	
181.2	..	Ditto	
182.3	..	Ditto	
182.5	ELISBETHEN	..	Passenger halt.
183.5	..	Bridge or culvert over stream (Klaus).	Line crosses minor road.
184.1	HEILBRUNN-GLAMENBACH	..	Passenger halt. Line crosses secondary road.
185.9	..	Bridge over stream.	
186.4	AIÖEN-GLAM	..	SR. 1 LS for storage left, 1 LS for storage right. Line crosses minor road.
187.1	..	Bridge over minor road.	Line crosses minor road.
187.4	..	..	J (facing) left, with short dead-end line c. 1 km. long which crosses R. Salzach.
187.4	..	Bridge or culvert over stream.	Line crosses minor road.

Km.	Stations	Engineering works	Details and facilities
174.1	PARICH (RENNING.)	2 road overbridges.	Passenger halt. Line crosses minor road. Carrying minor roads.
177.8	GNIBL (SALZBURG Vsp.)	Fly-over. Road overbridge.	MY. For details see Salzburg 174. Wb (36 t). J (facing) right, with a short DE spur. J (trailing) left, with connection to Berchtesgaden line. J (facing) left to MY and to DT line to Seindorf for Linz and Vienna. (This line is electrified from Salzburg to Attnang.) Line passes under Seindorf line. Line curves sharply left. J (facing) right, with ST s.o. line to Lamprechtshausen. J (trailing) right, with DT line from Seindorf.
182.2	SALZBURG Hbf.		SER. Wb (80 t). Cr (15 t). MY. ES. Tbl. W. Rps. 1 for narrow-gauge ST s.o. line to Ischl and Mondsee. ST electrified line to Berchtesgaden runs from an independent station NW of main station and is connected by 2 through tracks with station of Lamprechtshausen line. Main Passenger Station: 1 probable through platform road, adjoining main station building to W of main line. E of above, large island platform with 4 terminal bays at either end. 12 through tracks. E of passenger station: c. 8 DES with access from S, 183-366 m. long, 6 of which appear to be used for storage of passenger stock and 2 of which have loading facilities and good road access from E. S of passenger station, on W side: 3 DES, 320 m. long, with access from S, used for storage of passenger stock and for locomotives awaiting trains. Goods Depot: (a) N of passenger station: c. 13 DES with access from N 90-320 m. long, 5 of which have probable SR. Shed 75 x 12 m. and 3 smaller sheds. Good road access from SW. (b) NE of passenger station: 3 LS, 730 m. long and c. 7 DES with access from N 183-640 m. long, one with ER. 2 of the LS serve sheds 333 x 20 m. and 134 x 18 m. with SR. 2 of the DES serve shed 61 x 18 m. with SR. Good road access from SE. Lamprechtshausen: (c) S of passenger station: 18 SR type with 4 tracks, served by 1 LS and 2 with access from SW. The 18 DES are arranged

Km.	Stations	Engineering works	Details and facilities
			to be used for open work.
			To the S of the main station, average length 224 m. with 20 cars from SW, 5 of which have low platforms adjacent, and which may be used for servicing of electric locomotives or possibly of carriage stock.
			(b) N of passenger station: (steam tracks not electrified) ES (RH type) with c. 16 roads and 4 short spurs outside served by Tbl (24 m.). Access is from NE. 4 through tracks leading to Tbl. 2 short DES alongside. Coaling. Rps shops adjoining on NE side.
			Less Depot: (steam and electric) E of main station and SW of MY, with access from N. ES (RH) with c. 16 roads served from Tbl (18 m.). Proba. 7 used for steam locos. Coaling. Rectangular shed 116 m. x 27 m. adjoins RH on NE side. It is served by 3 roads. It is probably used for electric locos capacity c. 16.
			Marshalling Yard: 26 LS, average length c. 777 m. A further group of 9 LS average length c. 366 m. and 1 DES adjoining, situated NE of the yard and terminating at the N end in a shunting spur which extends for c. 366 m. parallel to the line from the main station, but at a higher level. Shunting probably by gravity from the N end.
			Rps is reached by facing connection left off the line to the station from Lamprechtshausen c. 366 m. before reaching the station.
			Trailing connection c. 640 m. N of station for ST spur from exchange sidings with main railway system.
			Rps consists of L-shaped shed (overall dimension 97 x 72 m.) served by c. 13 roads.
			Line passes over ST electrified line to Berchtesgaden.
1944		Fly-over. Bridge over R. Salzach. Bridge or culvert over stream. Bridge or culvert over stream (Glan).	J (facing) left, with line to goods station, military stores depot, and another goods station. Line may cross a main road (marked as projected on map). Line passes over industrial sidings. Line crosses 4 minor roads.
1970		Fly-over.	
1974		Bridge over stream (Mühl). Bridge over R. Saalach, tributary of R. Salzach. Culvert over stream. Bridge over road.	
1984			
1989	FRONT GARDEN		

SER. W 1100
 MY, 11000 GARDEN, 11000 G.
 ES, 11000
 LPS, 11000
 LPS, 11000
 LPS, 11000
 LPS, 11000

Km.	Stations	Engineering works	Details and facilities
			<p>Bruchengaden (maximum axle load 48 t). J (facing) right, with ST s.o. line (10.5 km. to Waging). J (facing) right, with short loop siding. J (trailing) right, with above. Line crosses minor road. Line crosses main road by station.</p>
202-6 203-0	NIEDERTRAM	Bridge or culvert over stream (Klein Sur).	Restricted goods facilities.
	..		Line crosses 2 minor roads. Line crosses main road. Line crosses minor road.
208-0	..	Culvert over stream.	Line crosses road. Line re-crosses road.
210-8	TEHENDORF	..	SER. Wb (30 t). Cr (7) (1 t). Line crosses secondary road.
211-3	..	Bridge or culvert over stream (Sur).	Line crosses several minor roads.
215-3	..	Bridge or culvert over R. Ach.	Line crosses minor road.
215-8	RUCHSTETTEN	Bridge or culvert over R. Forst Graben.	Restricted goods facilities.
	..		Line crosses minor road and curves left.
217-6	..	Bridge or culvert over stream.	Line crosses minor road.
218-7	..	Bridge or culvert over stream (Zeller).	Line crosses 2 minor roads, one of them at the station.
221-3	LAUTER (OBERBAY.)	..	SER. Wb (20 t). Line crosses 2 minor roads.
224-9	..	..	J (trailing) right, with ST s.o. dead-end line from Waging (12.6 km.). Line crosses minor and secondary road.
*226-4	..	Bridge over R. Traun.	Line curves SW and runs into station.
227-0	..	Road overbridge.	Carrying main road.
*227-3	TRAUNSTEIN	..	Electric sub-station. SER. Wb (40 t). Cr (1 t). Line crosses minor road at station. Line continues SW to Bergen and has several curves.
227-7	..	..	J (facing) right, with ST s.o. line to Garching (33.9 km.) on the Muhlendorf-Freilassing ST s.o. line (Route 1008). Line crosses 2 minor roads.
231-7	..	Bridge or culvert over stream (Muhl).	
231-8	..	Road overbridge.	Carrying autobahn from Munchen. Carrying minor road. Line crosses minor road.
231-9	..	Bridge or culvert over stream (Ammersbach).	Line crosses minor road.
231-9	..	..	SER. Wb (40 t).

WORGL TO ROSENHEIM

217

Km.	Stations	Engineering works	Details and facilities
			Line runs W to Bernau, S of the Chiem See. From Bernau to Prien line passes through country with many watercourses. Line crosses 2 minor roads.
238.5	..	Bridge or culvert over stream.	Line crosses secondary road.
241.1	..	Bridge over R. Tiroler Achen.	Line crosses minor road.
243.3	UBERSEE	..	SER. Wb (30 t). Line crosses minor road.
243.1	..	Bridge or culvert over stream.	Line crosses 2 minor roads.
247.4	..	Ditto	Line runs through marsh land. Line crosses minor road.
250.3	..	Ditto	
250.5	BERNAU (OBERBAY.)	..	SER. Wb (30 t). Line crosses 2 minor roads. Carrying autobahn from München.
251.2	..	Road overbridge.	Line runs NNW to Rimsting and on the W side of the Chiem See.
251.5	..	Bridge or culvert over stream (Bauerl).	
251.9	..	Ditto (Klee)	Line crosses minor road.
252.7	..	Bridge or culvert over stream.	
253.7	..	Ditto	J (trailing) left, with ST s.o. dead-end line from Aschau (8.8 km.).
254.7	..	..	Line crosses minor road.
255.5	PRIEN	..	SER. Wb (30 t). At station J (facing) right, with short dead-end spur running to lake. Line crosses 2 minor roads.
257.8	..	Ditto	Line crosses minor road and secondary road.
259.7	RIMSTING	..	SR. Wb (35 t). Line runs WNW to Endorf. Line crosses minor road.
261.6	..	Bridge or culvert over stream.	Line curves right. Line crosses 3 minor roads.
263.9	ENDORF (OBERBAY.)	..	SER. Wb (40 t). J (facing) right, with ST s.o. dead-end line to Obing (18 km.).
264.4	..	..	Line runs SW to Rosenheim. Line crosses several minor roads. Line runs on W side of the Sims See for c. 5 km.
269.1	KROFTSMÜHL	..	Restricted goods facilities.
272.2	SIMPEL	..	Halt.
274.2	ST. GEORG-KIRCHEN	..	SR. Wb (30 t). Line crosses 4 minor roads. Line crosses minor road.
276.0	..	..	J (trailing) left, with ST s.o. dead-end line from Prien (11.1 km.).

Km.	Stations	Engineering works	Details and facilities
276.9	..	Bridge or culvert over stream.	
277.4	..	Ditto	
278.0	..	Bridge over R. Inn.	
278.7	..	Bridge or culvert over stream.	
279.3	..	Bridge or culvert over stream (Mühl).	J (trailing) left, with DT electrified line Kufstein-München (Route 123).
279.8	..	Bridge or culvert over stream.	
280.4	..	Ditto	
*280.6	ROSENHEIM	..	Electric sub-station. Passenger Station: 7 through tracks. Loco Depot: 2 ES RH (total holding capacity c. 50), with small workshops attached. Tbl. W. Goods: SER. Wb (40 t). Cr (7.5 t). MY at Kolbermoor. J for DT electric line Innsbruck to München (Route 123). ST s.o. alternative route to München via Holzkirchen, and ST s.o. line to Mühldorf (Route 109).

ROUTE 123

JESENICE (ASSLING)/TARVISIO (TARVIS)-VILLACH-SPITTAL MILLSTÄTTERSEE-SCHWARZACH ST. VEIT

General Description

Note km. distances are given from Jesenice.

This is one of the few routes leading from Germany to Italy. Lines from the Balkans and Trieste converge on Jesenice in Yugoslavia; from here trains can either run N through the Karawanken tunnel to Rosenbach and Villach, or W to Tarvisio, and thence NE to Arnoldstein and Villach. From both Rosenbach and Villach lines run E to Klagenfurt (for Wien). Here the tracks divide, one branch running directly to Villach Hauptbahnhof, one bypassing this station and rejoining these lines E of it, and Route 123 turning sharply W to Lind Junction where it meets another connection from Villach Hbf. The line is DT from Warmbad Villach to Spittal.

Now follows the easiest section of the line. On a very gentle upgrade with few curves the line ascends the Drau valley in a general NW direction, keeping close to the steep left (NE) side of the valley and generally close to the river. At Spittal Millstättersee (72.8 km.) the line becomes ST and electrified and the Tauern line proper begins.

For approximately 5 km. the Tauern line and the ST s.o. line to San Candido in the Italian Dolomites run side by side. The San Candido line then turns away to the W up the Drau valley and the Tauern line begins its long ascent up the E side of the Moll Tal at an average gradient of 27.8 per mille. The most difficult section of all is from Peck to Obervellach (10.3-10.9 km.) where the side of the Moll Tal is broken by ravines and the line has to make long curves in tunnels and cross high viaducts to negotiate them. At Obervellach the station is 100 m. above the valley floor and is connected with the village by a cable car.

The line leaves the Moll Tal and ascends the valley of the Mallnitz, which is a gorge for the first 3 km. It then runs through the 8,551 m. long Tauern tunnel and emerges near the head of Gasteiner Tal on the N side of the Tauern range. From Bockstein, the station at the tunnel entrance to Bad Gastein (123.5 km.) the line runs along the E or right side of the valley, it then crosses the river just S of Bad Gastein station and immediately runs high up along the western side of the valley, the river running first in a gorge (at Bad Gastein itself), and then in a narrow flat-bottomed valley. Between Bad Gastein and Hofgastein (123.5 to 134.4 km.), and most notably between Angertal and Hofgastein, the line crosses numerous viaducts, runs through short deep cuttings, and winds continuously.

At Hofgastein (134.4 km.) the railway descends to the valley floor and runs on an embankment alongside the Gasteiner Ache. N of Klammsstein (144.5 km.) the river enters the Klamms Gorge, a winding ravine with overhanging walls, and the railway crosses the river, runs through the Oberer Klamms tunnel, crosses the river again, runs through the Unterer Klamms tunnel, and finally emerges on the right-hand (S) side of the Salzach valley. It immediately curves ENE running parallel with the Wörgl-Salzburg line (Route 124), crosses a further series of viaducts, runs through a short tunnel, and descends to the valley floor just W of Schwarzach St. Veit.

General Details

1. GARGY ELEVATION (4 ft. 8 in.) in S. Sea Level.

2. LENGTH:

Jesenice-Schwarzach, 144.5 km. (90 miles).
Tarvisio-Schwarzach, 111.3 km. (69 miles).

3. TRACK:

Jesenice-Rosenbach, double.
Rosenbach-Warmbach Villach, single.
Tarvisio-Warmbach Villach, single.
Warmbach Villach-Spittal Millstättersee, double.
Spittal Millstättersee-Mallnitz, single.
Mallnitz-Bockstein: Double.
Bockstein-Schwarzach St. Veit, single.

4. MAXIMUM PERMISSIBLE AXLE LOAD: 15 metric tons.

5. MAXIMUM GRADIENT:

27.8 per mille up, frequent, between Pusarnitz and Mallnitz.
28.1 per mille down between Klamstein and Schwarzach St. Veit.

6. MINIMUM RADIUS OF CURVES:

200 m. between Tarvisio and Thori-Maglern.
250 m. frequent throughout the line.

7. TRACTION:

Jesenice/Tarvisio-Spittal Millstättersee, steam.
Spittal Millstättersee-Schwarzach St. Veit, electrified. (15,000 V a.c. single-phase 16 2/3 cycles.) Power supply from Stubach and Mallnitz power stations. Sub-stations at Schwarzach St. Veit and Mallnitz.

8. MAXIMUM DISTANCE BETWEEN STATIONS: (passing loops on ST sections):

Rosenbach-Warmbach Villach, 6.6 km. (4 miles).
Spittal Millstättersee-Mallnitz, 6.6 km. (4 miles).
Tarvisio-Warmbach Villach, 8.5 km. (5 1/2 miles).
Bockstein-Schwarzach St. Veit: 8.6 km. (5 1/2 miles).

9. ENGINE SHEDS:

Arnoldstein. Jesenice. Rosenbach.
Villach Westbahnhof and Hauptbahnhof.
Spittal Millstättersee (probably).
Schwarzach St. Veit.

10. MARSHALLING FACILITIES:

Villach Westbf. Villach Hbf.
Smaller yards at Spittal Millstättersee and Schwarzach St. Veit, also at Jesenice (Yugoslavia) and Tarvisio (Italy).

11. WATERING FACILITIES:

Tarvisio. Spittal Millstättersee.
Arnoldstein. Penk.
Jesenice. Obervellach.
Rosenbach. Mallnitz.
Faak am See. Bockstein.
Villach Westbf. Angertal.
Villach Hbf. Schwarzach St. Veit.

12. VULNERABLE POINTS: Marked with asterisk in text.

Most of this line presented great difficulties of construction as it runs through the Karawanken and Tauern ranges of the Alps. Gradients are steep and curves sharp, and the only straightward section is the 40 km. of DT between Villach and Spittal, where the line follows the Drau valley.

(a) Locomotive and marshalling facilities in 9 and 10 above.

(b) Tunnels at 9.8 km. and 1.6 km (two tunnels on Tarvisio-Villach section), at 3.6 km. (Karawanken tunnel), at 95.9 km. (Zwenberg-Pfaffenberg Viaduct and tunnels), at 95.9 km.-101.9 km. (10 tunnels between Penk and Obervellach), at 100.2 km. (tunnel leading to Rapponig viaduct), at 105.9 km. (Dosen), at 110.4 km. (Tauern), at 144.5 km. (upper and lower Klamn tunnels).

(c) Junctions at Jesenice, Rosenbach, Villach, Klagenfurt and Lind.

(d) Bridges: At 9.2 km. and 22 km. (bridges over rivers Gailitz and Gail on Tarvisio-Villach section), at 30.8 km. (over R. Gail), at 36.2 km. (over R. Drau), at 86.1 km. (over Mühldorferbach), at 90.9 km. (over Ruckbach).

At 95.9 km. (Zwenberg-Pfaffenberg viaduct), at 101.1 km. (Rapponig viaduct).

At 95.9 km.-101.9 km. (5 bridges in Fank-Obervellach section).

At 123.5 km.-134.4 km. (11 viaducts and several smaller bridges on Bad Gastein-Hofgastein section).

At 119.7 km. (over Anlaufbach), at 125.8 km. (Winterreith viaduct), at 128.4 km. (Angertal viaduct), at 148.5 km. (Kenslachgraben viaduct).

At 114.5 km. (2 bridges over Gasteiner Ache) and at 151.1 km. (Thomernbach viaduct).

(e) Power stations and sub-stations as in (4) above.

13. CAPACITY:

	Trains per day each way	Net train load tons military stores
Jesenice-Rosenbach	48	200
Rosenbach-Villach	16	200
Tarvisio-Villach	16	200
Villach-Spittal	48	200
Spittal-Schwarzach	24	350 (electric traction)
Spittal-Schwarzach	12/15	200 (steam traction)

14. SIGNALLING:

Jesenice-Warmbach Villach: Telegraphic block working.
Warmbach Villach-Pusarnitz: Block working with block instruments.
Pusarnitz-Loifarm: Telegraphic block working.
Loifarm-Schwarzach St. Veit: Block working with block instruments.
Tarvisio-Thori-Maglern: Telegraphic block working.
Thori-Maglern-Arnoldstein: Block working with block instruments.
Arnoldstein-Warmbach Villach: Telegraphic block working.

15. TRAIN DESPATCHING: In force: train despatching centres at Tarvisio, Jesenice, Rosenbach, Villach Westbf., Spittal Millstättersee and Schwarzach St. Veit.

16. REPAIR SHOPS: Attached locomotive repair shops at engine-sheds. Wagon repair shops at Villach Westbahnhof.

Distance from Jelenice

Km.	Station	Engineering works	Details and facilities
0.0	JESENICE (Austrian) Alt. 573.0, mg. 21.1 up, 23.5 down, mrc. 250 m.		Gradient 2 up. SER. PL (500 m.). Wb (30 t). Wm. Large ES. Tbl. Small MY (at least 6 sidings). J with— (1) ST s.o. line SE to Ljubljana (Yugoslav State Railways). (2) ST s.o. line S to Prediccolle and Gorizia (Yugoslav and Italian State Railways). (3) ST s.o. line WNW to Tarvisio. This line runs parallel to Route 125 for 2 km., the two then separate and Route 125 passes over the Tarvisio line. Jesenice-Rosenbach section built as DT. One track reported taken up in 1937 but relaid in tunnel in 1940. Tunnel damaged in 1941 but now open. Line ascends N (left) side of narrow valley of R. Save to the Karawanken tunnel running WNW. Main road crosses station yard. Road crosses W end of station yard. Masonry.
0.6	..	Road overbridge.	
1.1	..	Road overbridge.	
1.6	..	Bridge over stream.	
1.7	..	Road overbridge.	
2.0	Rosenbach and Tarvisio lines divide.
2.7	..	Bridge over railway.	(Jesenice-Tarvisio line). Masonry.
3.2	..	Bridge over road.	Masonry.
3.4	..	Ditto. Main road.	Masonry.
3.6	..	Karawanken tunnel.	DT (see note above). (7,976 m. long. Straight rise of 6 per mille from S entrance for a distance of 3,958 m. followed by 250 m. level and a fall of 3 per mille for the remaining 3,768 m. to the Austrian entrance.)
7.1	Jugoslav-Italian frontier (in tunnel). Line turns NE, running on left side of narrow valley to Rosen- bach. Sharp bend.
11.7	..	Bridge over Gratschützengraben.	
12.9	ROSENBACH Alt. 600.9, mg. 16.9 down, 17.0 up, mrc. 250 m.	..	Gradient 2 up. SR. Wb (30 t). PL, at least 2 sidings. ES. Tbl. W. J (facing) with ST s.o. line E to Klagenfurt (km. 13). Line bends sharply NW and runs through the foothills of the Karawanken range.
14.4	..	Bridge.	Masonry.
14.9	..	Small bridge.	
15.4	..	Bridge.	Masonry.
15.7	..	Small bridge.	
16.8	..	Bridge over stream.	Masonry.
17.2	..	Bridge.	Masonry.
17.7	..	Bridge.	Masonry.
17.9	..	Bridge over track.	Masonry.
18.0	..	Bridge over stream.	Masonry.
18.4	..	Bridge over track.	Masonry.
19.5	LAIBACHEN Alt. 600.0, mg. 17.0 down, 17.1 up, mrc. 250 m.	..	SR. PL. Gradient 2 up. Wb (30 t). PL, at least 2 sidings. ES. Tbl. W. J (facing) with ST s.o. line E to Klagenfurt (km. 13). Line bends sharply NW and runs through the foothills of the Karawanken range.
20.0	..	Bridge.	Masonry.
20.4	..	Small bridge.	
21.4	..	Bridge.	Masonry.
21.9	..	Small bridge.	

Km.	Stations	Engineering works	Details and facilities
22.5	..	Bridge.	Masonry.
23.7	FAAKERSEE-STRAND (halt)	..	Line passes S end of Faakersee, a small lake, and turns slightly S.
24.0	..	Culvert.	
24.8	FAAK-AM-SEE Alt. 572.7 m., mg. 17 down, mrc. 400 m.	.. .. Bridge over stream.	SR. W. PL. Level. Line turns SW. Masonry. Immediately W of Faak station.
25.3	..	Bridge over road.	Masonry.
25.6	..	..	Line bends sharply WNW.
26.4	..	6 culverts.	In 1,300 m.
28.2	..	Bridge over stream.	Girder construction.
28.5	ST. STEFAN-MALLESTO (Halt), 530 m., mg. 17 down, mrc. 250 m.	..	Gradient :7 down.
29.6	..	Bridge over stream. Bridge over road.	Masonry. Immediately E of Finkenstein station.
30.1	FINKENSTEIN (510.9) mg. 14 down, mrc. 300 m.	..	SR. Wb. (30 t). PL.
30.3	..	Bridge over stream.	Masonry.
30.5	..	Bridge over stream.	Masonry.
30.8	..	Bridge over R. Gail.	Girder construction, 106 m. long. Bridge for Tarvisio line adjacent to W. (Alternative section of Route 125, see page 230.) Tarvisio-Villach and Jesenice-Villach lines run in parallel track to Warmbad-Villach.
31.6	..	Bridge over road.	DT. Girder construction.
32.2	..	Bridge over stream.	Masonry.
32.7	..	Bridge over stream.	Masonry. Line turns NNE and runs across the wide valley of the Drau.
33.0	WARMBAD VILLACH Alt. 497.0 m., mg. 7.2 up, mrc. 500 m.	..	PL and one siding. J (trailing) with ST s.o. line SE then SW to Arnoldstein and Tarvisio. (Route 125, see page 230.) Double track to Spittal Millstättersee.
34.4	..	Road overbridge.	
34.6	..	Overbridge (footpath).	
35.5	VILLACH WESTER Alt. 502.4 m., mg. 10 down, 7 up, mrc. 210 m.	..	SER. Wb (30 t). W. Passenger Station: 2 platforms (1 island). Goods Station: S of passenger station and E of line. 10 DES (200-300 m.), sheds and good road access. ESS of yard W of line: semi-RH, c. 12 covered tracks served by turntable, c. 25 m. with 6 approach tracks. 8 tracks (approx) in locomotive yard. Wag. & PAS: N of RH served by c. 10 tracks. MTN of ES, W of line: Parallel ES (c. 500 m.) with numerous short storage sidings on W side, and 10 long sidings (c. 800 m.) between passenger station and goods station on E and 1st group of ES and RPS sidings on W.

Km.	Stations	Engineering works	Details and facilities
35.9 +36.2	..	Road overbridge. Bridge over R. Drau.	3 parallel braced girder deck spans on masonry piers. J (facing) with— (1) DT through loop NW, by-passing Villach Hbf. to Lind (see below). Bridge over railway, road overbridge and small bridge on this loop. (2) DT through loop NE, by-passing Villach Hbf. and joining the Villach-St. Veit a.d. Glan and Villach-Klagenfurt lines E of Villach Hbf. Bridge over railway on this loop. Line turns NE into Villach Hbf.
36.3	..	Bridge over road. Road overbridge.	At W end of Villach Hbf. yard.
37.0	VILLACH Hbf. Alt. 498 m., mg. 4-6 down, mrc. 450 m.	..	<p>Passenger Station: 4 covered platforms (3 island), 7 platforms, tracks and 3 further through sidings.</p> <p>Goods Station: E of passenger station and S of line, approx. 900 m. long, transshipment sheds, 10-15 DES set at an angle to running roads.</p> <p>Loco. Depot: ES in angle formed by St. Veit a.d. Glan and Klagenfurt lines; semi-RH, c. 25 covered tracks, served by turntable, c. 25 m. with 3 or 4 approach tracks.</p> <p>RpS attached.</p> <p>Marshalling Yard: Main group of 10 LS (c. 750 m.) between main running roads and by-pass E of station, second group of 3 or 4 LS, W of ES, N of St. Veit line.</p> <p>SER. Wb (33 t). Cr (25 t). W. Level.</p> <p>J with— (1) ST line NE to St. Veit a.d. Glan. (2) ST line E to Klagenfurt.</p> <p>Trains for Spittal reverse and run along the left bank of the R. Drau to Gummern in a steep-sided valley c. 1 km. wide.</p> <p>Probably continuous to Spittal.</p> <p>Through loop from Villach Westbf. to St. Veit and Klagenfurt lines.</p> <p>Through loop from Villach Wbf. to Lind J.</p>
37.4	..	Embankment. Rail overbridge.	J (trailing) with through loop to Villach Westbf.
37.5	..	Ditto	
38.9	LIND JUNCTION Alt. 494.9 m., mg. 3 down, 5 up, mrc. 375 m.	..	
40.2 42.5	..	Bridge over stream. Bridge over stream.	Masonry. Masonry. Line on series of reverse curves to Gummern.
45.5	GUMMERN Alt. 500.4 m., mg. 0.3 down, 4 up, mrc. 250 m.	..	SER. Wb (25 t). Cr (15 t). At least 1 siding.
46.3	..	Bridge over stream	Level. Line turns N and continues along bank of river for 500 m. Masonry. Line enters W. then NW. Valley widens to 1,000 m. river width from side to side and railway runs near east side of valley.

Km.	Stations	Engineering works	Details and facilities
48.3 50.1	..	Bridge over stream. Ditto	Masonry. Ditto.
50.4	WERNSTEDT-KELTERBERG Alt. 505 m., mg. 0.3 down, 2.6 up, mrc. 472 m.	..	Halt.
53.0	..	Bridge over stream.	Masonry. At its confluence with R. Drau. Line curves W, then NW, and runs on the left bank of river, close to side of valley, for 4 km.
55.9	PATERNION-FESTITZ Alt. 512.3 m., mg. 0.4 up, mrc. 500 m.	..	On left bank of R. Drau. SR. Wb (35 t). At least 2 sdgs. Level.
58.4	MARK-PATERNION Alt. 513.0 m., mg. 1.5 up, mrc. 0 m.	..	On upgrade of 0.4. Line continues close to valley side to Rothenthurn.
60.4	HERAKLITWERK-FERN- DORF (Halt) Alt. 515.0 m., mg. 2.2 up, mrc. 800 m.	..	On upgrade of 1.5.
64.4	ROTHENTHURN Alt. 520.1 m., mg. 3.4 down, 5.2 up, mrc. 260 m.	..	SR. At least 2 sdgs.
65.2 66.4 71.8	..	Bridge over stream. Ditto Bridge over R. Lizer.	Masonry. Ditto
72.8	SPITAL-MILLSTÄTTERBAI Alt. 543.6 m., mg. 3.9 down, 100 up, mrc. 400 m.	..	Small workshops, also oil storage tanks, capacity c. 100 tons. SER. Wb (32 t). ES (RH) capa- city 15. Tbl (c. 20 m.). W. At least 7 sdgs. Downgrade of 2.4. J (facing) left with ST a.o. line W to S. Candido (Route 126); this line runs parallel with Route 125 for 6 km. Single track to Mallnitz. Continuous to Pusarnitz. DT. Masonry. Routes 126 and 125 divide.
78.3	..	Embankment. Bridge over stream.	Masonry.
80.4	..	Bridge over main road.	Masonry.
80.8	PUSARNITZ Alt. 561.9 m., mg. 27.8 up, mrc. 250 m.	..	On upgrade of 2.5. SR. Wb (32 t). PL. At least 1 sdg. Line now begins the ascent to the Tauern tunnel, climbing the E. side of the Moll Valley to Obervellach, general direction NW.
81.3 81.7 82.1 82.8 83.0 83.1 83.5	..	Bridge over road. Bridge over stream. Culvert. Bridge. Culvert. Culvert. Bridge over road.	Masonry. Masonry. Masonry, on sharp curve.
84.1	MUELEN-DE-MOLLBRUNN Alt. 561.2 m., mg. 27.8 up, mrc. 250 m.	Cuttings and embankments.	SR. PL. At least 1 sdg. On a grade of 2.4. Cuttings and embankments, tun- nel and bridges to Tauern tunnel.
84.1 84.1 84.1	..	Bridge over road. Culvert. Culvert.	Masonry. At least 1 sdg. NW of tunnel.

Km.	Stations	Engineering works	Details and facilities
*86.1	..	Bridge over Muldenfischbach.	5 masonry arches of 7.5 m., 2 braced deck girder spans of 27 m. and 65 m., and one masonry arch of 6 m. Total length 165.81 m.
86.6	..	Culvert (path).	
87.7	..	Culvert.	
88.4	..	Rottauer viaduct.	High masonry arch viaduct of at least 5 spans \approx 15 m. each.
88.9	KOLBNITZ Alt. 747.2 m., mg. 27.8 up, mrc. 270 m.	..	Gradient 2.0 up. SR. Wb (30 t). PL, at least 1 sidg. Immediately N of Kolbnitz station.
89.7	..	Bridge.	Masonry.
*90.9	..	Bridge over Ruckenbach.	Masonry. Main deck braced girder span of 83 m., with 4 masonry approach spans of 4 m. at S end and 3 at N end. Total length 179.17 m. Line runs straight for 1,500 m.
91.3	..	Culvert.	
91.6	..	Ditto	
92.3	..	Ditto	
92.6	..	Ditto	
92.9	..	Ditto	
93.3	..	Tunnel.	\approx 100 m. long.
93.4	..	Bridge.	Masonry, immediately following tunnel above.
94.3	..	Ditto	Masonry.
94.5	..	Ditto	Ditto
95.3	PZENK Alt. 898.7 m., mg. 27.8 up, mrc. 250 m.	..	SR. PL, at least 1 siding. W. Gradient 2.5 up.
*95.5	..	Pfaffenberg tunnel.	\approx 400 m. long, leading directly to viaduct.
*95.9	..	Zwenberg-Pfaffenberg viaduct.	3 parallel braced girder deck spans of 35 m., 60 m., and 35 m. on masonry piers and abutments; small masonry arch at S end, possibly also at N end. Total span 125 m., height 60 m. Viaduct leads directly to next tunnel.
*96.1	..	Zwenberg tunnel.	\approx 350 m. long.
*96.8	..	Tunnel.	\approx 500 m. long on curve, leading directly to next bridge.
97.4	..	Bridge over stream.	Masonry, on sharp curve leading to short tunnel.
97.5	..	Short tunnel.	
97.7	..	Tunnel.	\approx 250 m. long.
*98.3	..	Tunnel.	\approx 400 m. long leading directly to bridge.
98.8	..	Bridge over stream.	Masonry, on curve leading directly to next tunnel.
99.0	..	Tunnel.	\approx 200 m. long.
99.5	..	Ditto	\approx 100 m. long.
*100.2	..	Ditto	\approx 800 m. long on reverse curve, leading directly to bridge. Line describes a long curve round the Kapponig valley to Oberzellach station.
*101.1	..	Kapponig Viaduct.	Masonry, on long sharp curve.
101.3	..	Tunnel.	\approx 150 m. long, leading directly to bridge.
101.4	..	Bridge.	Masonry, at E end of Oberzellach station.
101.9	OBERZELLACH Alt. 1,044.7 m., mg. 27.8 up, mrc. 250 m.	..	PL, at least 1 siding W. Formerly down to village, 100 m. below on valley floor. On a grade of 2.5. Under station. M. & F. E. turns W. The line could turn N to

Km.	Stations	Engineering works	Details and facilities
			Follow the R. Mallnitz which runs in a gorge for the first 4 km. Line generally on a high shelf.
103.2	..	3 culverts.	
103.4	..	Overbridge.	Masonry.
103.7	..	Bridge.	Masonry.
104.0	..	Bridge.	
104.6	..	Culvert.	
104.9	..	Bridge over stream.	Masonry.
105.1	..	Culvert.	
105.2	..	Bridge.	Masonry.
105.4	..	Culvert.	
105.7	..	Bridge.	
		Dosen viaduct.	Masonry construction, main span 92 m., and 2 small side spans, height 35 m.
*105.9	..	Dosen tunnel.	881 m. long.
107.7	MALLNITZ Alt. 1,180 m., mg. 16 up, 10 down, mrc. 262 m.	..	SER. Wb (30 t). ES (rectangular). Capacity 2. W. Tbl (20 m.). 3 LS for storage. Gradient 2.0 up. Double track to Bockstein.
108.7	..	Bridge over road.	
109.0	..	Culvert.	
110.1	..	Bridge over Seebach.	
*110.4	..	Tauern tunnel.	Road bridge adjacent to E. DT, 8,551 m. long. (Note. The tunnel was originally planned to be 8,506 m. long and this figure is erroneously given on some maps.) Straight direction NNW; up-grade of 2 per mille for 1,896.5 m.; down-grade of 3.3 per mille for 917.9 m. and 10 per mille for 5,636.7 m.; greatest depth of tunnel 1,367 m. Driven through granite gneiss and schist, often with abundant water content, shingle and detritus on N side up to 370 m. from entrance. Line emerges in the Anlauf valley immediately S of Bockstein station.
114.4	BOCKSTEIN Alt. 1,171.3 m., mg. 27.4 down, mrc. 230 m.	..	SER. Wb (30t). W. Tbl (20). Small ES (rectangular for 2 locos). Gradient 2.3 down. Single track to Schwarzach.
*119.7	..	Bridge over Anlaufbach. Short deep cutting.	Total length 42 m., girder with masonry side arches.
120.4	BOCKSTEIN HALTESTELLE (Halt) Alt. 1,153.3 m., mg. 27.4 down, mrc. 230 m.	Culvert.	Immediately N of halt. Line descends the E side of the Gasteiner Tal.
120.8	..	Culvert.	
121.0	..	Ditto	
121.7	..	Bridge.	Masonry.
122.5	..	..	Line curves sharply NW to cross the Gasteiner Tal which here narrows abruptly to a gorge.
123.0	..	Bridge over road.	Masonry.
*123.2	..	Bridge over Gasteiner Ache.	Girder construction span 24 m.
123.5	BOCKSTEIN Alt. 1,144 m., mg. 27.4 down, mrc. 230 m.	..	SER. PL. At least 3 side sp. Gradient 2.0 down. Masonry. Line continues N of Bockstein station. Length 2.0 m.

Km.	Stations	Engineering works	Details and facilities
			Line runs high up on the W side of the Gasteiner Tal, descending to the valley floor at Hofgastein. Bad Gastein lies in a gorge and immediately N of the station are high retaining walls.
124.0	..	Cutting and embankments.	Continuous series to Hofgastein.
124.2	..	Bridge.	Masonry (?).
124.5	..	Bridge.	Masonry (?).
124.6	..	Cutting.	c. 400 m. long.
125.0	..	Bridge.	Masonry (?).
125.5	..	Bridge.	Masonry (?).
125.6	..	Culvert.	
*125.8	..	Wintereith viaduct.	Masonry, 10 spans of 6 m. and 10 of 5 m.
126.9	..	Pichlwald viaduct.	Masonry spans 3 x 8 m.
127.0	...	Schmalgrubenbach viaduct.	Masonry, spans 3 x 10 m.
		4 culverts.	
128.2	ANGERTAL Alt. 975.5 m., mg. 27.4 down, mrc. 250 m.	..	S.R. W. PL; at least 1 siding. On downgrade of 2.5. Immediately N of station.
*128.4	..	Angertal viaduct.	Braced girder arched deck span of 110 m. on masonry abutments, with approach masonry arch of 9 m. at S end. Height from bottom of ravine 80 m., width 6.4 m.
		Short cutting.	Line follows a winding course to Hofgastein.
129.7	..	Fahlombach viaduct.	Masonry, spans 12 m. + 16 m. + 12 m., total length 50 m., height 18 m.
		Cutting.	c. 100 m. long.
129.9	..	Hunsdorfer viaduct.	Masonry, spans 2 x 16 m. and 4 x 12 m., total length 130 m., height 24 m.
		Short cutting.	
130.2	..	Weitroseer viaduct.	Masonry, spans 1 x 16 m., 3 x 12 m., and 2 x 10 m., total length 90 m., height 22 m.
		Short cutting.	
130.4	..	Overbridge.	
		Short embankment.	
130.7	..	Pyrkershohe viaduct.	Masonry, spans 5 x 12 m., total length 75 m., height 20 m.
130.9	..	Steinbach viaduct.	Masonry, spans 2 x 20 m., 1 x 16 m., 1 x 12 m., and 1 x 10 m. Total length 90 m.
131.3	HOFGASTEIN (HALTSTELLE) Alt. 911.7 m., mg. 27.4 down, mrc. 150 m.	..	Halt. On downgrade of 10 per mille.
132.3	..	Bridge over Laidalpbach.	Girder span 20 m.
133.0	..	Overbridge.	
133.1	..	Bridge over Wiedneralpbach.	Girder span 10 m.
133.8	..	Bridge over stream.	
134.4	HOFGASTEIN Alt. 811.8 m., mg. 12 down, mrc. 300 m.	..	Gradient 2.5 down. S.R. PL and 2 I.S. for storage.
		Embankment.	Continuous to bridge over the Gasteiner Ache. Line runs on left bank of the river in valley c. 300 m. wide general direction N.
135.7	..	Culvert.	
136.7	..	Culvert.	
136.9	..	Bridge over Gasteiner Bach.	
137.3	..	Culvert.	
137.7	..	Culvert.	
137.8	..	Bridge over road.	

Km.	Stations	Engineering works	Details and facilities
137.4	DEBBACHTRIN Alt. 822.7 m., mg. 18 down, mrc. 270 m.	..	SR. Wb (32 t.), PL, at least 1 siding. Gradient 1:6 down.
141.7	..	Bridge over stream.	..
141.9	..	Bridge over Gasteiner Ache.	Girder construction, span 23 m. Line runs along right bank of Gasteiner Ache, main road alongside to E.
142.6	..	Bridge over stream.	..
143.8	..	Ditto	..
144.5	KLAMMSTEIN Alt. 721.9 m., mg. 28.1 down, mrc. 250 m.	..	Halt.
		Bridge over Gasteiner Ache.	Skew; semi-through beamed girder span of 23 m. on masonry abut- ments. Road bridge adjacent to E. River winds through a narrow rocky gorge to join the R. Sal- zach. Railway cuts straight across in two tunnels. Note. The greater part of these two tunnels did not require lining.
		Oberer Klammtunnel.	744 m.
		Bridge over Gasteiner Ache.	Joining the two tunnels. Girder span 22 m.
		Unterer Klammtunnel.	731.83 m.
			Line leaves tunnel on curve radius 250 m. and turns E by N along the side of the Salzach valley, descending gradually until it reaches the valley floor at Schwarzach. The Innsbruck- Salzburg line (Route 1230) runs parallel to Route 123 along the river bank.
		Punzinggraben viaduct.	W of Loifarm stn., spans 3 x 8 m. and 2 x 6 m.
148.0	LOIFARM Alt. 721.9 m., mg. 28.1 down, mrc. 250 m.	..	SR; PL. At least 1 sidg. Gradient 2:5 down.
148.3	..	Kenlachgraben viaduct	Girder. Main span 73 m., side span of 6 m., height 30 m.
148.8	..	Kenlachgraben tunnel.	99.16 m. long Line descends a succession of reverse curves to Schwarzach.
149.2	..	Mursingerbach bridge. Burslgraben embankment Cutting.	Masonry, span 25 m., height 14 m. 10 m. high
151.1	..	Thomerschbach viaduct	Masonry, span 4 x 6 m., 2 x 4 m., and 1 x 6 m. Height 12 m.
151.7	..	Unterschbach viaduct	179 m. long
152.7	..	Bridge over stream	..
153.7	SCHWARTZACH ST. VERT Alt. 721.9 m.	..	..

Km.	Stations	Engineering works	Details and facilities
			J (trailing) left with ST a.c. dead-end line N, then W to Katschach-Mauthen (25 km.). Max. permissible axle load 16 t to Herinayce. ST Herinayce to Katschach-Mauthen; line runs N, crosses R. Gail by a through highbacked braced girder span of c. 30 m. on masonry abutments. It then turns WNW and runs along the N side of the Gail valley with numerous bridges and sharp curves.
		Road overbridge.	Immediately E of Arnoldstein station across MY.
11.4	..	Bridge.	Masonry.
13.4	..	Bridge over stream.	Masonry.
13.7	POCKAU .. Alt. 554 m., mg. 16.7 down, mrc. 325 m.	..	Halt.
14.4	..	Bridge over stream.	Masonry.
16.0	..	Bridge over stream.	Masonry.
16.1	..	Ditto	
16.3	NEUMARK A.D. GAIL .. Alt. 518 m., mg. 18.1 down, 11.0 up, mrc. 400 m.	Embankment.	Halt. Line runs close to R. Gail which has numerous arms, to Mullern.
18.0	..	Bridge over stream.	Masonry.
18.3	..	Bridge over main road.	Masonry.
19.2	FURNITZ ..	..	SR. Wb (30 t). PL and LS both c. 700 m. long. 3 DES E of station, N of line, access from W, c. 600 m. long. Masonry, immediately E of Furnitz station.
		Bridge over stream. Short cutting.	
21.7	MULLERN .. Alt. 524 m., mg. 8 down, mrc. 300 m.	..	Halt. Line curves NW on embankment.
22.0	..	Bridge over R. Gail.	Girder construction. Bridge for Jesenice-Villach line adjacent to E.
22.6	..		From here to Villach line corresponds with Jesenice-Villach line.
24.1	WARNBAD VILLACH		

ROUTE 126

S. CANDIDO (INNICHEN) SPITAL-MILLSTÄTTERSEE

General Description

This is a part of the single track line which connects the Brenner line at Fortezza with the Tauern line at Spital-Millstättersee and is chiefly important as an alternative to either route. It follows the valley of the R. Drau (Drave) throughout, the valley starting as a gorge and widening as it receives its tributaries, the Isel and the Moll.

General Details

1. GAGE: 1:125 mm. (1 in. = 12.5 ft.) Standard
2. TRACK: 1435 mm. (57 in.) Standard
3. TRACK: Single

4. MAXIMUM PERMISSIBLE AXLE LOAD: 16 metric tons.

5. MAXIMUM GRADIENT:

- 25 per mille down between Abfalterbach and Mitterwald a.d. Drau.
- 5 per mille up between S. Candido and Viersbach and Viersbach and Weirathbrunn.

6. MINIMUM RADIUS OF CURVES:

- 250 m. between S. Candido and Lienz.

7. TRACKS: Single.

8. MAXIMUM DISTANCE BETWEEN STATIONS:

- 10 km. (6.2 miles) (Fals-Lienz).

9. *E. LINE SHELDS:*

S. Candido. Possibly also shed for electric locomotives at Spittal-Millstättersee.
Lienz.

10. *MARSHALLING FACILITIES:*

Small yard at Spittal-Millstättersee.

11. *WATERING FACILITIES:*

S. Candido. Detach in route.
Abfalterbach. Klebach-Lienz.
Thal. Spittal.
Lienz.

12. *VULNERABLE POINTS:* Marked with asterisk in text.

- (a) Locomotive and marshalling facilities as in 9 and 10.
(b) Km. 6.48-6. Bridge over R. Isel.
Km. 101-1. Bridge over R. Möll.
Km. 104-9. Bridge over stream (double track).

There is no detailed information available about the engineering works on this line but the stone bridges are probably fairly large. The whole line runs between high mountains, and the Pustertal valley from S. Candido to Lienz, i.e. the upper Drau valley, is practically a gorge, the railway running high up along the side of the valley with few but sharp curves and steep gradients.

13. *CAPACITY:*

16 trains per day each way, of 200-250 net tons military stores.

14. *SIGNALLING:*

No information available.

15. *TRAIN DISPATCHING:*

Train control in operation, centralised at Lienz and Spittal.

16. *REPAIR SHOPS:*

No information available.

Distances from S. Candido

Km.	Stations	Engineering works	Details and facilities
0	S. CANDIDO (INNICHEN) Alt. 1,116-8 m., mg. 18 down, 3 up, mrc. 280.	..	Gradient 0. Wb (30 t); W; ES; Tbl; PL; at least 2 sidings. Line descends the narrow valley of the R. Drau (Drave), closely following the main road to Weit- lanbrunn. General direction ESE and left side of valley to Verreschach (Vierschach) halt. The valley of the Drau known as the Pustertal is followed to Spittal, the line running either on embankment or on a terrace up the valley side.
3.0	..	8 culverts or bridges.	Line crosses main road W of Verreschach halt.
6.1	VERRESCHACH (VIERSCHACH) Alt. 1,126-1 m., mg. 18 down, mrc. 280.	..	Gradient 2.0 down, 3 up. Halt.
8.1	..	3 culverts or bridge.	Italo-Austrian frontier.
9.3	WEITLANBRUNN Alt. 1,108-2 m., mg. 18-8 down, mrc. 280 m.	..	Gradient 18.0 down. Halt. Line follows right bank of river closely to Tassenbach; main road follows left side of valley.
9.8	..	Bridge over road. 4 culverts or bridges.	
12.3	SILLIAN Alt. 1,080 m., mg. 7.9 down, mrc. 280 m.	..	ES. Rectangular, capacity 4 locom. Tbl. FR. SR. Wb (30 t). PL at least 1 siding.
12.6	..	Road overbridge.	Gradient 2.0 down.
13.6	..	Bridge over Sagelbach.	
15.3	TASSENBACH Alt. 1,070-4 m., mg. 17.9 down, mrc. 280.	..	Halt.
17.0	..	Bridge over R. Drau (Drave)	Line crosses Drau into Austria at Verreschach.
17.0	..	Bridge over road. Bridge over R. Drau (Drave)	Line crosses into Austria at Verreschach.

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Km.	Stations	Engineering works	Details and facilities
17.4	ASBALTENBACH Alt. 1,075.9 m., ing. 25 down, mrc. 280.	Bridge over main road.	Gradient 2.5 down. SR. PL., at least 1 siding.
17.7	..	Bridge over stream.	Immediately N. of Asbaltenschach station.
17.9	..	Small bridge.	Main road runs between railway and river almost to Mitterwald.
20.1	..	Ditto	
20.2	..	Bridge over road.	
20.9	..	Ditto	
21.0	..	Bridge over Eribach.	
21.1	..	Bridge over road.	
22.1	..	Ditto	
23.2	..	Ditto	
23.4	..	Bridge over Mühlbach.	Line curves sharply ESE, taking in the bridges, then sharply SE to cross the main road.
24.6	..	3 small bridges.	
25.4	..	Bridge over main road. Embankment.	Continuous to Thal, close to the left bank of the Drau.
26.4	MITTEWALD A.D. DRAU Alt. 894.3 m., ing. 18 down, mrc. 280 m.	..	Gradient 2.5 down. SR. PL.
26.8	..	Bridge over Kristeinbach.	
27.1	..	Bridge over stream.	
29.1	..	Ditto	
30.0	..	Bridge.	On sharp curve.
31.4	..	Bridge over Thalerbach.	Line runs straight for 1,500 m.
31.8	..	Bridge over Neustallbach.	
32.6	THAL Alt. 811.5 m., ing. 18 down, mrc. 280 m.	..	Gradient 2.5 down. SR. W. PL.
33.4	..	Bridge.	For the next 6 km. the Drau runs through a very narrow wooded valley. The line follows a rather winding course.
33.6	..	Bridge over stream.	
34.9	..	Bridge over Filzbach.	
34.4	..	Culvert.	
38.8	..	Bridge over main road.	
39.9	..	Embankment.	
41.0	..	Bridge over arm of R. Drau.	
41.6	..	Small bridge.	
41.6	..	Ditto	
44.6	LIENZ Alt. 674.0 m., ing. 3 down, mrc. 600 m.	..	SR. with 10 sidings & sidings throughout 2.5 km. SR. W. PL. W. PL. 1.5 km. PL. At about 4 km. ing. Station and siding with road to R. Line and a branch to R. road to R. station and R. road Continued to M. 4.5 km. ing. Station and siding with R. road R. 1.5 km.

RAILWAYS

Km.	Stations	Engineering works	Details and facilities
57.0	..	Bridge over stream.	Line and main road run close to left side of valley to Oberdrauburg.
57.4	..	Bridge.	
57.7 57.7	..	Bridge over stream. Bridge over R. Drau.	
61.1	OBERDRAUBURG Alt. 621.2 m., mg. 5 down, mrc. 316 m.	..	Gradient 2.8 down. SR. Wb (25 t). PL. At least 1 siding. Station on right bank of R. Drau.
61.8	..	Bridge over R. Drau.	Halt.
62.5	..	Culvert.	
62.8	..	Bridge over stream.	
64.3	INSCHEM Alt. 615.5 m., mg. 5.6 down, mrc. 807 m.	..	Halt.
65.1	..	Bridge over stream.	
69.2	DELLACH IM DRAUTALE Alt. 604.3 m., mg. 4.0 down, 2.5 up, mrc. 575 m.	..	
70.2	..	3 small bridges. Bridge.	Halt.
73.6	Berg Alt. 598.6 m., mg. 5.0 down, 2.5 up, mrc. 377 m.	..	
74.4	..	2 small bridges.	
76.3	..	Culvert.	Immediately S of Berg halt. Line turns E and runs along left bank of river to Greifenburg station.
76.9	..	Culvert.	
77.3	..	Bridge over stream.	
78.6	..	Ditto Ditto	Immediately W of Greifenburg station.
78.9	GREIFENBURG- WEINENHUB Alt. 588.5 m., mg. 5.0 down, mrc. 380 m.	..	
80.5	..	Ditto	
81.2	..	Ditto	Immediately SE of Steinfeld station.
81.2	..	Ditto	
81.2	..	Ditto	
84.5	STEINFELD IM DRAUTALE Alt. 581.5 m., mg. 5 down, mrc. 400 m.	..	Gradient 3 down. SR. PL.
84.5	..	Ditto	Gradient 2 SR. Wb (25 t). W. PL. At least 1 siding.
84.5	NEUSTADT-LEND Alt. 579.9 m., mg. 4.5 down, mrc. 350 m.	..	
84.5	..	Ditto	
84.5	..	Bridge over stream.	Gradient 2.5 down. Halt. At least 1 siding. River bends to the ESE to join the Mill. A way runs on left bank of river to steep valley side.
84.5	..	Ditto	
84.5	..	Ditto	

Km.	Stations	Engineering works	Details and facilities
100.3	MÖLLBRÜCKEN-SACHSBERG Alt. 557.5 m., mg. 3.0 mrc. 380 m.		Gradient 0. S.P.R. Wb (13.1). PL. At least 1 siding.
100.9 *101.1	..	Bridge over stream. Bridge over R. Möll. Embankment.	Line turns ESE and runs straight on embankment to Lendorf.
104.4	LENDORF Alt. 548.7 m., mg. 5.4 down, 3.9 up, mrc. 474 m.	Embankment.	Halt. Gradient 1.9 down. Continuum to Spittal.
*104.9	..	Bridge over stream (double track).	ST electrified line NW from Schwarzach-St. Veit (Tauern line, Route 125, joins Route 126 at this bridge and the two lines run in parallel tracks to Spittal along the eastern (left) edge of the Draa valley. For 2 km. river is close to railway.
*110.8	SPITAL-MILLSTÄTTERSEE Alt. 543.6 m.		R. Wb (13.1). W. At least 6 sidings. Tbl. Possibly ES, built on electrification of Tarvisio/ Jesenice-Schwarzach-St. Veit line (Route 125).] with— (1) ST. Electrified line NW to Schwarzach-St. Veit (Route 125). (2) DT &c. line SE to Villach. Thence to Tarvisio or Jesenice (Route 125).

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DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW
1155 DEFENSE PENTAGON
WASHINGTON, DC 20301-1155

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[REDACTED]

This refers to our letter to you dated October 7, 1999, regarding your appeal to the Information Security Oversight Office for 14 documents previously requested under Mandatory Declassification Review procedures. One document (AD346727) was provided to you by our letter dated November 19, 1999.

The review of 11 British documents you requested is complete and there are no objections to release. Titles of these documents are contained on the enclosed sheet and a copy of each is enclosed. We will advise you as soon as the reviews of the remaining two documents are completed

*Per DoD letter,
Please mark these 11
documents "available
to the public."*

Sincerely,

SIGNED

H. J. McIntyre
Director

AD-036 799
AD-044 992
AD-048 643
AD-057 151
AD-057 524
AD-057 525
AD-057 526
AD-057 527
AD-122 495
AD-136 830
AD-139 544



*I verified the docs
could be marked
available for public
release via telecon
with Pat Skinner,
DoD Security Review,
695-9556/6428 on
21 Jan 2000.*

*Kelly Akers
DTIC-RS*



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